RULES, REGULATIONS AND SYLLABUS FOR THE DEGREE OF B.Sc. ENGINEERING (MECHANICAL)

November 2022

DEPARTMENT OF MECHANICAL ENGINEERING

Bangladesh University of Engineering and Technology (BUET)

Dhaka-1000, Bangladesh

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(*OBE (Outcome Based Education) curriculum will be included soon.)

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CONTENTS

PREFACE

This bulletin is aimed at the undergraduate students of Mechanical Engineering Department of BUET. Although this bulletin has been written primarily for the undergraduate students, student advisers would also find it valuable as a reference document.

It attempts to provide some general information about the university, its historical background, faculties/departments, university administration, departments / divisions in the Faculty of Mechanical Engineering and provides a list of its teaching members. Different aspects of the course system, such as the rules and regulations relating to admission, credit structure, course offering instructions, attendance, teacher-student interaction, grading system, performance evaluation, requirement for degrees, *etc.* are introduced. It describes the detailed course outline, course requirements, and the courses offered in different terms for the undergraduate students of Mechanical Engineering.

Some of the information noted in this booklet is likely to be modified from time to time. Students are strongly advised to be in touch with their advisers regarding modifications that are introduced by the University.

We hope this information bulletin will be very useful to the new undergraduate students and to the student's advisers of the Department of Mechanical Engineering, BUET.

Editor

1.0 GENERAL INFORMATION

1.1 The University

Historical Background of the University

Bangladesh University of Engineering & Technology (BUET) is the oldest institution for the study of Engineering and Architecture in Bangladesh. Today's BUET originated as Survey School at Nalgola in 1876 to provide training to the surveyors for the then Government of Bengal of British India. As the years passed, the Survey School became the Ahsanullah School of Engineering offering three-year diploma courses in Civil, Electrical and Technical Engineering. In 1948, the School was upgraded to Ahsanullah Engineering College (at its present premise) as a Faculty of Engineering under the University of Dhaka, offering four-year bachelor's degrees in Civil, Electrical, Mechanical, Chemical and Metallurgical Engineering. This action was taken with a view to meet the increasing demand for engineers in the newly independent country and to expand the facilities for quicker advancement of engineering education, in general. In order to create facilities for postgraduate studies and research, in particular, Ahsanullah Engineering College was upgraded to the status of a University giving a new name of East Pakistan University of Engineering and Technology in year 1962. After the birth of Bangladesh in 1971, it was renamed as the Bangladesh University of Engineering and Technology.

A Partial View of Dr. M. A. Rashid Building

Till today, it has produced around 30000 graduates in different branches of engineering and has established a good reputation all over the world for the quality of its graduates, many of whom have excelled in their profession in different parts of the globe. It was able to attract students from countries like India, Nepal, Iran, Jordan, Malaysia, Sri Lanka, Pakistan and Palestine, Saudi Arabia. The BUET campus is now in the heart of the city of Dhaka. It has a compact campus with halls of residence within walking distance from the academic buildings.

Undergraduate courses in the faculties of Engineering, Civil Engineering, Electrical & Electronic Engineering and Mechanical Engineering extend over four years and lead to B.Sc. Engineering degrees in Civil, Water Resource, Electrical & Electronic, Computer Science & Engineering, Bio-Medical Engineering, Mechanical, Industrial & Production Engineering, Chemical, Metallurgical and Naval Architecture & Marine Engineering. In the Faculty of Architecture and Planning, the degree of Bachelor of Architecture is obtained in five years and the degree of Bachelor of Urban and Regional Planning is obtained in four years.

Postgraduate studies and research are now among the primary functions of the university. Most of the departments under the different faculties offer Master's Degrees and some of the departments have Ph.D. programs. In addition to its own research programs, the University undertakes research programs sponsored by outside organizations, like UNO, Commonwealth, UGC, etc. The expertise of the University teachers and the laboratory facilities of the University are also utilized to solve problems of and to provide up-to-date engineering and technological knowledge to the various organizations of the country. The University is persistent in its effort to improve its research facilities, staff position and courses and curricula to meet the growing technological challenges confronting the country.

1.2 Faculties, Departments and Teachers

At present, the university has eighteen teaching departments under five faculties. A total of about 608 teachers are teaching in these faculties. In addition, there are posts of Dr. Rashid Professor, Professor Emeritus and Supernumerary Professors.

1.3 University Administration

Vice-Chancellor	Prof. Dr. Satya Prasad Majumder
Pro-Vice-Chancellor	Prof. Dr. Abdul Jabbar Khan
Administrative Officers	
Registrar	Prof. Dr. Md. Forkan Uddin
Controller of Examinations	Prof. Dr. Mohammed Imamul Hassan Bhuiyan
Comptroller	Md. Jasim Uddin Akond
Director of Student's welfare (DSW)	Prof. Dr. Md. Mizanur Rahman
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Librarian	Prof. Dr. Samia Subrina
Chief Engineer	Engr. Dr. A.K.M. Jahangir Alam

Deans of Faculties	
Mechanical Engineering	Prof. Dr. Md. Ehsan
Electrical and Electronic Engineering	Prof. Dr. Quazi Deen Mohd Khosru
Civil Engineering	Prof. Dr. Abu Siddique
Chemical and Materials Engineering	Prof. Dr. Mohammad Tamim
Architecture and Planning	Prof. Dr. Ishrat Islam
Faculty of Science	Prof. Dr. Md. Abdur Rashid
Heads of Departments	
Mechanical Engineering	**Prof. Dr. Muhammad Ashiqur Rahman**
Industrial and Production Engineering	Prof. Dr. Ferdous Sarwar
Naval Architecture & Marine Engineering	Prof. Dr. Md. Shahidul Islam
Civil Engineering	Prof. Dr. Md. Delwar Hossain
Water Resources Engineering	Prof. Dr. A. T. M. Hasan Zobeyer
Chemical Engineering	Prof. Dr. Md. Mominur Rahman
Materials & Metallurgical Engineering	Prof. Dr. A. K. M. Bazlur Rashid
Nanomaterials and Ceramic Engineering	Dr. Md. Abdullah Zubair
Chemistry	Prof. Dr. Al-Nakib Chowdhury
Mathematics	Prof. Dr. Khandker Farid Uddin Ahmed
Physics	Prof. Dr. Nasreen Akter
Petroleum and Mineral Resources	Prof. Dr. Mohammad Mahbubur Rahman
Electrical and Electronic Engineering	Prof. Dr. Md. Aynal Haque
Computer Science and Engineering	Prof. Dr. Mahmuda Naznin
Biomedical Engineering	Prof. Dr. Muhammad Tarik Arafat
Architecture	Prof. Dr. Mohammed Zakiul Islam
Urban and Regional Planning	Prof. Dr. Afsana Haque
Humanities	Prof. Md. Murshikul Alam

Provosts of Residential Halls	
Ahsanullah Hall	Prof. Dr. Md. Rafi Uddin
Nazrul Islam Hall	Prof. Dr. Md. Abdul Alim
Titumir Hall	Prof. Dr. Mohammad Abu Sayem Karal
Sher-e-Bangla Hall	Prof. Dr. Md. Shakhawat Hossain Firoz
Suhrawardy Hall	Prof. Dr. Mohammad Al Amin Siddique
Dr. M.A. Rashid Hall	Prof. Dr. Syed Mithun Ali
Sabekun Nahar Sony Hall	Prof. Dr. Fahmida Gulshan
Bangamata Sheikh Fojilatunnesa Mujib Hall	Prof. Dr. Rowshan Mamtaz
Shahid Smrity Hall	Prof. Dr. Md. Mostafa Ali

2.0 DEPARTMENT OF MECHANICAL ENGINEERING

2.1 Introduction

Mechanical Engineering is generally understood to emphasize on energy, including its transformation from one form to another, its transmission, and its utilization, and on applied mechanics, and design. The mechanical engineering undergraduate and graduate programs provide excellent technical background for persons who want to work in mechanics (solid/fluid) and heat transfer, energy, environmental pollution control, and other multidisciplinary professions where a good understanding of technology is often very important. Throughout the study programs, considerable emphasis is placed on the development of systematic procedures for analysis and design, and on the responsible use of technology.

The undergraduate program leading to B.Sc. Engineering (Mechanical) degree prepares the student for a career in engineering with an emphasis on the technical areas of fluid and thermal energy systems and the conversion of thermal energy to other forms of energy, mechanical systems and machines, and design and control of these systems. In addition to lecture and practical sessions in classrooms, the undergraduate program also includes industrial visits and on-site industrial training for about four weeks. The postgraduate program provides specialization in the above-mentioned areas.

Fluid Mechanics Laboratory

Heat Engine Laboratory

Performing Experiments in Heat Transfer Laboratory

Performing Experiments in Fuel Testing Laboratory

Boiler Laboratory of the Department

Performing Experiments in Applied Mechanics Laboratory

Undergraduate Computer Laboratory

High Speed Aero Lab

Design Process and Simulation Laboratory

Model Lab

Departmental Library

The department is organized into three major divisions: Thermal Engineering, Fluid Mechanics, and Applied Mechanics. A fourth division, Computation, and Instrumentation, has recently been introduced to help the other three divisions with computational problems and designs. Each division maintains its own laboratories. The Thermal Engineering division covers the areas of thermo-sciences, applied thermodynamics, energy systems, heat transfer, and pollution control. The Fluid Mechanics division offers courses and specialized work in the areas of fluid mechanics, aerodynamics, gas dynamics and machinery in general, and fluid dynamics, and experimental and computational fluid mechanics. The Applied Mechanics division emphasizes on such areas as, dynamics, mechanics of deformable solids, design of machine elements, kinematics, and fatigue and fracture mechanics.

At present, there are about sixty-six well qualified teachers in the department specialised in one of the above mentioned fields. Many of them have postgraduate degrees from well reputed universities of the developed countries. A good number of teachers are now studying abroad for postgraduate degrees.

List of teachers and staffs of the department

Head of the department

MUHAMMAD ASHIQUR RAHMAN; *B.Sc. Engg. (Mech.), BUET; M.Sc. Engg., BUET; Ph.D., Tohoku University, Japan (Noise & Vibration, Smart materials, Structural Stability).*

Professors Emiretus

Md.Quamrul Islam, B.Sc. Engg (BUET), M.Sc. Engg (BUET), Ph.D. (VUB,Belgium). (Renewable Energy,Fluid Mechanics,Hydraulic Machines)

Professors

MUHAMMAD MAHBUBUL ALAM; *B.Sc.Engg.(Mech.), BUET; M.Sc. Engg., BUET; Ph.D., University of Reading, U.K. (Wind Engineering, WECS, Wind Turbine Yaw, Renewable Energy, Vertical Transportation, Bio-fuel, Refrigeration and A/C).*

ABU RAYHAN MD. ALI; *B.Sc.Engg.(Mech.), BUET; M.Sc.Engg., BUET; Ph.D., Dublin University, Ireland (Applied mechanics, Elastic-plastic stress analysis, Plastic yielding, Mechanical design).*

MD. EHSAN; *B.Sc.Engg.(Mech.), BUET; M.Sc.Engg., BUET; Ph.D., University of Edinburgh, U.K. (Alternative Fuels for IC Engines, Automobiles, Dynamic system modelling, CAD).*

MD. ZAHURUL HAQ; *B.Sc.Engg.(Mech.), BUET; M.Sc.Engg., BUET; Ph.D., Leeds University, U.K. (Combustion, alternative fuels, Instrument & Control, Mechatronics & Robotics, Refrigeration & A/C Building Mechanical Systems).*

MOHAMMAD ALI; *B.Sc.Engg.(Mech.), BUET; M.Sc.Engg., BUET; Ph.D., Nagoya University, Japan (Turbulence, gas dynamics, fluid mechanics)*

MD. ASHRAFUL ISLAM; *B.Sc.Engg.(Mech.), BUET; M.Sc.Engg., BUET; Ph.D., Saga University, Japan (Phase change heat transfer, Thermal Engineering, Renewable Energy)..*

SHAIKH REAZ AHMED; *B.Sc.Engg.(Mech.), BUET; M.Sc.Engg., BUET; Ph.D., Tohoku University, Japan (NDT of Materials, Computational Mechanics, Composite Structure).*

MUHAMMAD ASHIQUR RAHMAN; *B.Sc. Engg. (Mech.), BUET; M.Sc. Engg., BUET; Ph.D., Tohoku University, Japan (Noise & Vibration, Smart materials, Structural Stability).*

MD. AFSAR ALI; *B.Sc.Engg.(Mech.), BUET; M.Sc. Engg., Tohoku University, Japan; Ph.D., Tohoku University, Japan (Composite materials, Functionally graded materials (FGMs), Fracture mechanics).*

MUHAMMED MAHBUBUR RAZZAQUE; *B.Sc.Engg.(Mech.), BUET; M.Sc. Engg., BUET; Ph.D., Tokyo University, Japan (Tribology, Fluid Film Lubrication, Fluids Engineering, Noise Control).*

MOHAMMAD ARIF HASAN MAMUN*; B.Sc. Engg. (Mech.), BUET; M.Sc.Engg., BUET; Ph.D., University of Waterloo, Canada (Thermal Engineering, HVAC, CFD, Renewable energy).*

MD. ABDUS SALAM AKANDA; *B.Sc.Engg.(Mech.), BUET; M.Sc. Engg., BUET; Ph.D., Tohoku University, Japan (Applied Mechanics, Micro/Nano Mechanics, NDT).*

MOHAMMAD MAMUN; *B.Sc. Engg. (Mech.), BUET; M.Sc. Engg. (Mech.), BUET; Ph.D., Saga University, Japan (Aerodynamics, CFD, Automobiles, Renewable Energy).*

ALOKE KUMAR MOZUMDER; *B.Sc. Engg. (Mech.), BUET; M.Sc. Engg. (Mech.), BUET; Ph.D., Saga University, Japan (Phase change heat transfer, Inverse solution, Fuel & Energy).*

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A. B. M. TOUFIQUE HASAN; *B.Sc. Engg. (Mech.), BUET; M.Sc. Engg. (Mech.), BUET; Ph.D., Saga University, Japan (Aerothermodynamics, Biofluid Dynamics, Micro Fluids).*

MOHAMMAD NASIM HASAN; *B.Sc. Engg. (Mech.), BUET; M.Sc. Engg. (Mech.), BUET; Ph.D., Saga University, Japan (Thermal Engineering, Phase Change Heat Transfer).*

A.K.M. MONJUR MORSHED; *B.Sc. Engg. (Mech.), BUET; M.Sc. Engg. (Mech.), BUET Ph.D., North Carolina State University, USA (Electronic Cooling, Renewable Energy, Boiling Heat Transfer*

MOHAMMAD ABDUL MOTALAB; *B.Sc. Engg. (Mech.), BUET; M.Sc. Engg. (Mech.), BUET; Ph.D., Auburn University, USA (Stress and Failure Analysis of Micro-Electronic Components, Electronic Packaging, FEM).*

MD. ASHIQUR RAHMAN; *B.Sc. Engg. (Mech.), BUET; M.Sc. Engg. (Mech.), BUET; Ph.D., University of Illinois at Urbana Champaign, USA. (Thermal Sciences, Multi-phase Heat Transfer, Micro-electronics Cooling)*

SUMON SAHA; *B.Sc. Engg. (Mech.), BUET; M.Sc. Engg. (Mech.), BUET. Ph.D., University of Melbourne, Australia (Turbulent Flow, Computational Fluid Dynamics (CFD), Computational Heat Transfer (CHT)).*

Associate Professors

MONON MAHBUB; *B.Sc. Engg. (Mech.), BUET; M.Sc. Engg. (Mech.), University of Alberta, Ph.D, Ohio State University (Nanocomposite materials, Viscoelastic materials,Carbon nanofibers and nanotubes)*

Assistant Professors

SANCHITA AMIN; *B.Sc. Engg. (Mech.), BUET; M.Sc. Engg. (Mech.), BUET.*

KAZI ARAFAT RAHMAN; *B.Sc. Engg. (Mech.), BUET; M.Sc. Engg. (Mech.), BUET, Ph.D, Purdue University (Ultrafast lasers, Linear and nonlinear spectroscopy, Laser diagnostics, Propulsion)*

SHAHEREEN CHOWDHURY; *B.Sc. Engg. (Mech.), BUET; M.Sc. Engg. (Mech.), BUET, Ph.D, Mcmaster University (Micro and nano mechanical*

property evaluation, Physical vapor deposition (PVD) tool coatings, Surface engineering, Applied mechanics)

MOHAMMAD JANE ALAM KHAN; *B.Sc. Engg. (Mech.), BUET; M.Sc. Engg. (Mech.), BUET. Ph.D., Rensselaer Polytechnic Institute (Mechanics of Material, Dislocation and Plasticity, Energetic Materials, and Molecular Dynamics Simulation)*

SHEIKH MOHAMMAD SHAVIK; *B.Sc. Engg. (Mech.), BUET; M.Sc. Engg. (Mech.), BUET., Ph.D Michigan State University (Biomechanics, Cardiovascular mechanics, Computational methods, Finite element method, Fluid-structure interaction)*

MD. AMAN UDDIN; *B.Sc. Engg. (Mech.), BUET; Ph.D., University of Connecticut (Electrochemical Energy Systems, Polymer Electrolyte Fuel Cells, Redox Flow Battery, Energy Materials)*

MD. RAKIB HOSSAIN*; B.Sc. Engg. (Mech.), BUET, M.Sc. Engg. (Mech.), BUET*.

MD. IMRUL KAYES; *B.Sc. Engg. (Mech.), M.Sc. Engg. (Mech.), BUET.*

MD. IKRAM KHAN; *B.Sc. Engg. (Mech.), M.Sc. Engg. (Mech.), BUET*.

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MANTAKA TAIMULLAH; *B.Sc. Engg. (Mech.), M.Sc. Engg. (Mech.),* BUET.

SAIF AL-AFSAN SHAMIM; *B.Sc. Engg. (Mech.), BUET*.

SHAHRIAR ALAM; *B.Sc. Engg. (Mech.), BUET*.

PRIOM DAS; *B.Sc. Engg. (Mech.), BUET.*

MD. ASADUZZAMAN SOUROV; *B.Sc. Engg. (Mech.), BUET.*

MD. AMINUL ISLAM; *B.Sc. Engg. (Mech.), BUET*.

On Leave

MD. ZAHABUL ISLAM; *B.Sc. Engg. (Mech.), BUET; M.Sc. Engg. (Mech.), BUET. (on leave)*

ADNAN MORSHED; *B.Sc. Engg. (Mech.), BUET; M.Sc. Engg. (Mech.), BUET. (on leave)*
AMINUL ISLAM KHAN; *B.Sc. Engg. (Mech.), BUET; M.Sc. Engg. (Mech.), BUET. (on leave)*
MD. JAMIL HOSSAIN; *B.Sc. Engg. (Mech.), BUET; M.Sc. Engg. (Mech.), BUET. (on leave)*
CYRUS ASHOK ARUPRATAN ATIS; *B.Sc. Engg. (Mech.), BUET ; M.Sc. Engg. (Mech.), BUET. (on leave)*
MD. ABDUL HAMID; *B.Sc. Engg. (Mech.), BUET ; M.Sc. Engg. (Mech.), BUET. (on leave)*
MUHAMMAD JAHIDUL HOQUE; *B.Sc. Engg. (Mech.), BUET ; M.Sc. Engg. (Mech.), BUET. (on leave)*
ANUP SAHA; *B.Sc. Engg. (Mech.); M.Sc. Engg. (Mech.), BUET.(on leave).*
RIFAT MAHMUD; *B.Sc. Engg. (Mech.), BUET, M.Sc. Engg. (Mech.), BUET.(on leave)*
MD. SADDAM HOSSAIN JOY; *B.Sc. Engg. (Mech.), BUET; M.Sc. Engg. (Mech.), BUET. (on leave)*
SOURAV SAHA; *B.Sc. Engg. (Mech.), BUET; M.Sc. Engg. (Mech.), BUET. (on leave)*

SATYAJIT MOJUMDER; *B.Sc. Engg. (Mech.); M.Sc. Engg. (Mech.), BUET. (on leave)*
PARTHA KUMAR DAS; *B.Sc. Engg. (Mech.),* BUET; *M.Sc. Engg. (Mech.), BUET. (on leave)*
MUNTASIR ALAM; *B.Sc. Engg. (Mech.),* BUET; *M.Sc. Engg. (Mech.), BUET.(on leave)*
MD. KAMRUZZAMAN; *B.Sc. Engg. (Mech.),* BUET*; M.Sc. Engg. (Mech.), BUET. (on leave)*
MD. TUSHER AHMED*; B.Sc. Engg. (Mech.),* BUET; *M.Sc. Engg. (Mech.), BUET. (on leave)*
MD. TANVER HOSSAIN*; B.Sc. Engg. (Mech.),* BUET; *M.Sc. Engg. (Mech.), BUET.(on leave)*
MUSANNA GALIB*; B.Sc. Engg. (Mech.), BUET; M.Sc. Engg. (Mech.), BUET. (on leave)*
MD. RAKIBUL HASAN RONI*; B.Sc. Engg. (Mech.),* BUET; *M.Sc. Engg. (Mech.), BUET. (on leave)*
NUSRAT JAHAN SALIM*; B.Sc. Engg. (Mech.), BUET; M.Sc. Engg. (Mech.), BUET. (on leave).*
MD. RAIHAN ALI KHAN*; B.Sc. Engg. (Mech.), M.Sc. Engg. (Mech.), BUET. (on leave)*
MD. OMARSANY BAPPY; *B.Sc. Engg. (Mech.), BUET, M.Sc. Engg. (Mech.), BUET. (on leave)*
ABRAR AMIN KHAN; *B.Sc. Engg. (Mech.), BUET*, *M.Sc. Engg. (Mech.), BUET. (on leave)*
ABDUL AZIZ SHUVO; *B.Sc. Engg. (Mech.), BUET*, *M.Sc. Engg. (Mech.), BUET. (on leave).*

ARIF ABDULLAH ROKONI; *B.Sc. Engg. (Mech.), BUET; M.Sc. Engg. (Mech.), BUET. (on leave)*
ASHIQUE ALAM REZWAN; *B.Sc. Engg. (Mech.), BUET; M.Sc. Engg. (Mech.), BUET. (on leave)*
AHMAD SHAHEDI SHAKIL; *B.Sc. Engg. (Mech.), BUET (on leave).*
SUJAN DEWANJEE*; B.Sc. Engg. (Mech.), BUET. (on leave)*

Administrative Officer

MD. SHAHIDULLAH

SHEIKH MD. TAUHIDUZZAMAN

2.2 Facilities Offered by the Department

All three divisions mentioned earlier, maintain modern laboratories which are used for both undergraduate and graduate instruction and graduate research work. Facilities offered by the Mechanical Engineering Department of BUET both in terms of teachers and equipment are undoubtedly the best in the country. The Department has the following laboratories:

1. Turbulence Laboratory
2. Fluid Mechanics and Machineries Laboratory
3. Heat Engine Laboratory
4. Boiler and Steam Laboratory
5. Heat Transfer Laboratory
6. Refrigeration and Air Conditioning Laboratory
7. Fuel Testing Laboratory
8. Model Laboratory
9. Design and Drafting Laboratory
10. Applied Mechanics Laboratory
11. Measurement and Control Laboratory
12. Computer Laboratory
13. Material Testing Laboratory
14. Solar Energy Laboratory
15. Bio-Mechanics Laboratory
16. Design process simulation Lab
17. Bio-Fluids Laboratory
18. High Speed Aero Lab
19. CNC Laboratory

Many of these laboratories are equipped with microcomputers. The students are given a firsthand practical knowledge in these laboratories, of what they are taught in theory classes as well as of what they are supposed to do afterwards. The undergraduate students can have hands-on experience of cutting-edge computational facilities. The graduate and

undergraduate Computer Laboratory host a large number of networked workstations for the students to hone their programming, computer aided design and other software skills. For computational research, the graduate computer lab is also equipped with high performance computing facility.

2.3 Study Programs

Mechanical Engineering Department offers the degrees of B.Sc. Engg., M. Engg., M.Sc. Engg. and Ph.D. The courses and syllabus followed by this department for the above degrees are the most modern ones like that of advanced countries as well as appropriate to the local needs. A mechanical engineer is expected to take the responsibility of design, fabrication and installation of industrial and production plants and of management, and maintenance. He/she is also expected to have expertise on design, testing, calibration and repair of all kinds of mechanical equipment and engines. The syllabus is so designed as to contain all these so that a graduate can face the engineering problems readily after graduation. The teachers of the department meet periodically to review the courses and their contents; necessary changes are made to update the needs and trends from time to time.

3.0 COURSE SYSTEM*

3.1 Introduction

From the academic session 1990-91, the Department of Mechanical Engineering is following a course system for undergraduate studies leading to B.Sc. Engineering (Mechanical). Given below is an extract from the Report of the Committee for Framing Recommendations for Implementation and Administration of Course System of instruction at undergraduate level as approved in the meetings of the Academic Council held on 24.9.92, 30.9.92, 4.10.92 and 19.10.92.

* For more information, please refer to “Rules and Regulations for Course System”, Bangladesh University of Engineering and Technology, Dhaka, May 1999.

Only relevant sections of the report are included so that students can have a clear understanding about the Course System from academic session 1990-91. The rules and regulations for administering undergraduate curricula through Course System will be applicable for students admitted to this university in First Year Classes in Engineering and Architecture in 1990-91 and subsequent sessions. Henceforth, unsuccessful students of the earlier annual system of undergraduate studies will be absorbed in the relevant of level and term under the course system. Students are advised

to keep track of subsequent amendments/modifications that will be notified from time to time.

3.2 The Course System

The undergraduate curricula at Bangladesh University of Engineering & Technology (BUET) are based on the course system. The salient features of the course system are:

(i) reduction of the number of theoretical courses and examination papers around five in each term,
(ii) the absence of a pass or a fail on an annual basis,
(iii) continuous evaluation of student's performance,
(iv) introduction of Letter Grades and Grade Points instead of numerical grades,
(v) introduction of some additional optional courses and thus enable students to select courses according to his interest as far as possible,
(vi) opportunity for students to choose fewer or more courses than the normal course load depending on his/her capabilities and needs,
(vii) the flexibility to allow the student to progress at his own pace depending on his ability or convenience, subject to the regulations on credit and minimum grade point average (GPA) requirements, and
(viii) promotion of teacher-student contact.

In the curriculum for the undergraduate programs, besides the professional courses pertaining to each discipline, there is a strong emphasis on acquiring a thorough knowledge in the basic sciences of Mathematics, Physics and Chemistry. Due importance is also given for the study of several subjects in Humanities and Social Sciences which will help the student to interact more positively with the society in which he lives. Thus the course contents of the undergraduate programs provide a harmonious blend of both basic sciences and their applications as well as their social relevance.

The first two terms of bachelor's degree programs consist of courses in basic sciences, mathematics, humanities and social sciences, basic engineering and architecture subjects. The third and subsequent terms build directly on the knowledge of the basic subjects gained in the first two terms and go on to develop competence in specific disciplines.

3.3 Student Admission

*Added vide A.C. Resolution dated 16.11.95

Students will be admitted in undergraduate curricula in the Departments of Architecture, * Urban and Regional Planning, Chemical Engineering, Civil Engineering, Computer Science and Engineering, Electrical and Electronic Engineering, Mechanical Engineering,

** Added vide A.C. Resolution dated 22,26.12.96
*** Added vide A.C. Resolution dated 18.3.97

Industrial and Production Engineering, * Materials and Metallurgical Engineering, **Water Resources Engineering and Naval Architecture and Marine Engineering as per existing rules of the university. The Registrar's Office will continue to serve as Admissions Office and will deal with course registration in addition to student admission.

3.4 Number of Terms in a Year

There will be two Terms (Term I and Term II) in an academic year. In addition to these two regular Terms there may be a Short Term in the intervening period between end of Term II and commencement of Term I. During this term students, those who need, may take additional courses either to make up deficiencies in credit and GPA requirements or to fulfill the credit requirements for bachelor's degree spending less time than the normal duration; and other students may take vacation.

3.4.1. Duration of Terms

The duration of each of Term I and Term II will be 18 weeks which will be used as follows:

Classes	14 weeks
Recess before Term Final Examination	2 weeks
Term Final Examination	2 weeks
Total	18 weeks

The duration of a Short Term will be around 8 weeks of which about 7 weeks will be spent for class lectures and one week for Term Final Examination.

3.5. Course Pattern and Credit Structure

The entire undergraduate program is covered through a set of theoretical and laboratory/sessional/studio courses.

3.5.1 Course Designation and Numbering System

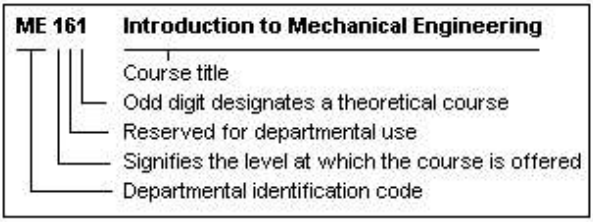
Each course is designated by a four letter word identifying the department which offers it following by a three-digit number with the following criteria:

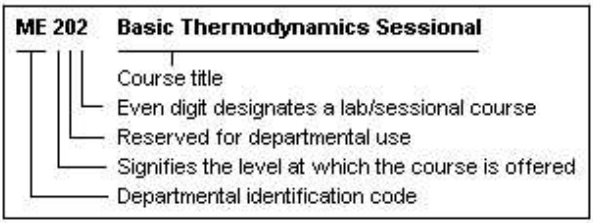
(a) The first digit will correspond to the year/level in which the course is normally taken by the students.

(b) The second digit will be reserved for departmental use for such things as to identify different areas within a department.

(c) The last digit will usually be odd for theoretical and even for laboratory or sessional courses.

The course designation system is illustrated by two examples.





3.5.2 Assignment of Credits

(i) Theoretical Courses:
One lecture per week per term will be equivalent to one Credit.

(ii) Laboratory/Sessional/Design:
Credits for laboratory/sessional or design courses will be half of the class hours per week per term.

Credits are also assigned to project and thesis work taken by students. The amount of credits assigned to such work may vary from discipline to discipline.

The curriculum does not demand the same rate of academic progress from all students for obtaining the degree but only lays down the pace expected of a normal student. A student whose background or capacity for assimilation is lower will be permitted to complete the program at a slower pace by studying a lesser number of courses during a given term (subject to a minimum course load). He may keep pace with his class by taking during the Short Term those courses which he had dropped during the Regular Terms, or by covering the entire degree program over an extended period without developing any feeling of inferiority complex.

3.6 Types of Courses

The courses included in undergraduate curricula are divided into several groups as follows:

3.6.1 Core Courses

In each discipline a number of courses will be identified as core courses which form the nucleus of the respective bachelor's degree program. A student has to complete all of the designated core courses for his discipline.

3.6.2 Pre-requisite Courses

Some of the core courses are identified as pre-requisite courses. A pre-requisite course is one which is required to be completed before some other course(s) can be taken. Any such course, on which one or more subsequent courses build up, may be offered in each of the two regular terms.

3.6.3 Optional Courses

Apart from the core courses, students will have to complete a number of courses which are optional in nature in that students will have some choice to choose the required number of courses from a specified group/number of courses.

3.7 Course Offering and Instruction

The courses to be offered in a particular term will be announced and published in the Course Catalog along with a tentative Term Schedule (Annexure 2) before the end of the previous term. Whether a course is to be offered in any term will be decided by the respective **BUGS** (Board of Undergraduate Studies). Respective department may arrange to offer one or more pre-requisite or core courses in any term depending on the number of students who dropped or failed the course in the previous term.

Each course is conducted by a teacher. The course teacher is responsible for maintaining the expected standard of the course and for the assessment of student's performance. Depending on the strength of registered students (i.e. the number of students) enrolled for course, the teacher concerned might have course associates and teaching assistants (TA) to help him in teaching and assessment.

For a course strength necessitating two or more parallel classes or sections, one of the course teachers or any other member of the teaching staff of the department be designated as course coordinator. He/she has the full responsibility for coordinating the work of the other members of the department involving in that course.

3.8. Departmental Monitoring Committee

Consistent with its resilient policy to keep pace with new developments in the field of science and technology, the university will update its course curriculum at frequent intervals (at least every three years). Such updating aims not only to include the expanding frontiers of knowledge in the various fields but also to accommodate the changing social, industrial and professional need of the country. This can be done through deletion and modification of some of the courses and also through the introduction of new ones.

Amended Vide A.C Resolution dated 7.9.93 & 13.9.93

BUGS of each department will constitute ***Departmental Monitoring Committee*** *with th teachers from the department. This committee monitor and evaluate the performance of the Cou System within the department. In addition to ot teachers of the department, the committee may a propose from time to time to the Board Undergraduate Studies any changes a modifications needed for upgrading Undergraduate Curriculum and the Course System*

3.9 Teacher Student Contact

The proposed system encourages students to come in close contact with teachers. For promotion of teacher-student contact, each student is assigned to an Adviser and the student is free to discuss with his adviser all academic matters, especially those related to courses taken and classes being attended by him. Students are also encouraged to meet with other teachers any time for help on academic matters.

3.10 Student Adviser

One Adviser would normally be appointed for a batch of student by the Undergraduate Board of Studies of the concerned department(s) who will advise each student on the courses to be taken by a student. Adviser will discuss with the student his academic program and then decide the number and nature of courses for which he can register. However, it is the student's responsibility to keep contacts with his adviser who will review and eventually approve the student's specific plan of study and check on subsequent progress. The adviser should be in the rank of an Assistant Professor or above from the concerned department(s).

For a student of second and subsequent terms, the number and nature of courses for which he can register will be decided on the basis of his academic performance during the previous term. The adviser will advise the students to register for the courses during the next term within the framework of the guidelines in respect of minimum/maximum credit hours limits, etc. which are elaborated at appropriate places in this report. He is also authorized to permit the student to drop one or more courses based on his academic performance and the corresponding categorization

(Art.3.16). Special provisions exist for academically weak students with regard to make-up courses (Art. 3.19).

3.11 Registration Requirements

Any student who makes use of class room or laboratory facilities or faculty time is required to register formally. Being admitted to the university, each student is assigned to a student adviser. The student can register for courses he intends to take during a given term only on the basis of the advice and consent of his adviser.

3.11.1 Registration Procedure

Students must register for each class in which they will participate. Each student will complete his/her Course Registration in consultation with and under the guidance of his/her adviser. The registration process in completely online based through BUET Institutional Information System (BIIS). Students need to log on to-

http://biis.buet.ac.bd/

for this purpose. Much counseling and advising are accomplished at registration time.

3.11.2 Limits on the Credit Hours to be Taken

A student must be enrolled in at least 15 credit hours. He/she may be allowed to enroll in up to a maximum of 24 credit hours if recommended by his/her Adviser. A student must enroll for the prescribed sessional/laboratory courses in the respective Term within the allowed credit-hour limits.

Added Vide A.C Resolution dated 28.8.97	In special cases where a student cannot be allotted the minimum required 15 credit hours in a Term, the relevant BUGS may approve a lesser number of credit hours to suit individual requirements. Such cases shall only be applicable to students needing less than 15 credits for graduation.

3.11.3 Pre-condition for Registration

A student will be allowed to register in those courses subject to the capacity constrains and satisfaction of pre-requisite courses. If a student fails in a pre-requisite course in any Term, the concerned BUGS may allow him to register for a course which builds on the pre-requisite course provided his attendance and grades in continuous assessment in the said pre-requisite course is found to be satisfactory.

Registration will be done at the beginning of each term. The Registration program with dates and venue will be announced in advance. Late registration is, however, permitted during the first week on payment of a late registration fee. Students having outstanding dues to university, or a hall of residence shall not be permitted to register. All students have, therefore, to clear their dues and get a clearance or no dues certificate, on the production of which, they will be given necessary Course Registration Forms (Annexure 3) and complete the course registration procedure. Registration Forms will normally be available in the Register's Office. However, for the First-Year students, prior department-wise enrollment/admission is mandatory. An orientation program will be conducted for them at the beginning of the first term when they will be handed over the registration package on producing enrollment slip/proof of admission.

3.11.4 Pre-registration

Pre-registration for courses to be offered by the students in a particular term will be done on a specified dates before the end of the previous term. All students in consultation with their course adviser are required to complete the pre-registration formalities, failing which a fine of Tk. xx.xx (amount may be decided by the authority) will have to be paid before

registration in the next term. Further a student who does not pre-register may not get the courses desired by him subsequently.

3.11.5 Registration Deadline

Student must register for the courses to be taken before the commencement of each term and no late registration will be accepted after one week of classes. Late registration after this date will not be accepted unless the student submits a written appeal to the Registrar through the concerned Head and can document extenuating circumstances such as medical problems (physically incapacitated and not able to be presented) or some other academic commitments which precluded enrolling prior to the last date of registration.

Amended Vide A.C Resolution dated 26.5.94

Student must register for the courses to be taken before the commencement of each term and no late registration will be accepted after one week of classes. Late registration after this date will not be accepted unless the student submits a written appeal to the Registrar through the concerned Head and can document extenuating circumstances such as medical problems (physically incapacitated and not able to be presented) from the Chief Medical Officer of the University or some other academic commitments which precluded enrolling prior to the last date of registration.

3.11.6 Penalty for Late Registration

Students who fail to register during the designated dates for registration are charged a late registration fee of Tk. **** (amount may be decided by the authority). This extra fee will not be waived whatever be the reason for late registration.

Amended Vide A.C Resolution dated 26.5.94

Students who fail to register during the designated dates for registration are charged a late registration fee of Tk. 100.00 (One hundred) only. This extra fee will not be waived whatever be the reason for late registration.

3.11.7 Course Adjustment Procedure

Amended Vide A.C Resolution dated 7.9.93 & 13.9.93

A student will have some limited options to add or delete courses from his/her registration list, within the first two weeks from the beginning of the term. He/She may add courses only within the first two weeks of a regular Term and only the first week of Short Term. Incase of dropping a course a student will be allowed to do so within four weeks after the commencement of a regular Term and two weeks after commencement of a Short Term. Adjustment of initially registered courses in any term can be done by duly completing the **Course Adjustment Form (Annexure 4).** These forms will normally be available in the Registrar's Office. For freshman students such forms can be included in the registration packet at the time of orientation.

Any student willing to add or drop courses will have to fill up a Course Adjustment Form in consultation with and under the guidance of his adviser. The original copy of the **Course Adjustment Form** will be submitted to the Registrar's Office, and then the requisite number of photo copies will be made by the Registrar's Office for distribution to the concerned Adviser, Head, Dean, Controller of Examination and the student.

All changes in courses must be approved by the Adviser and the Head of the department concerned. The Course Adjustment Form will have to be submitted to the Registrar's Office after duly filled in and signed by the concerned persons. To **add/drop** a course respective teacher's consent will be required.

3.11.8 Withdrawal from a Term

Amended Vide A.C Resolution dated 7.9.93 & 13.9.93

If student is unable to sit for a Term Final Examination due to serious illness or serious accident, he/she may apply to the Head of the degree awarding department for total withdrawal from the Term within a week after the end of the Term Final Examination. The application must be supported by a medical certificate from the Chief Medical Officer of the university. The Academic Council will take the final decision about such applications.

Amended Vide A C Resolution dated 14.3.96

If a student is unable to complete the Term Final Examination due to serious illness or serious accident, he/she may apply to the Head of the degree awarding department for total with drawl from the Term within a week after the end of the Term Final Examination. However, he/she may choose not to withdraw any laboratory / sessional / design course if the grade obtained in such a course is 'D' or better. The application must be supported by a medical certificate from the Chief Medical Officer of the University. The Academic Council will take the final decision about such application.

3.12 The Grading System

Amended Vide A.C Resolution dated 7.9.93 & 13.9.93

The total performance of a student in a given course is based on a scheme of continuous assessment. For theory courses this continuous assessment is made through a set of quizzes/in class evaluation, class participation, homework assignments, and a term final examination. The assessment in laboratory/sessional courses is made through observation of the student at work in class, viva-voce during laboratory hours, and quizzes. For architecture students, assessments in design sessionals would be done through evaluation of a number of projects assigned throughout the term. As discussed earlier, each course has a certain number of credits which describe its weightage. A letter grade with a specified number of grade points is awarded in each course for which a student is registered. A student's performance is measured by the number of credits that he/she has completed satisfactorily and the weighted average of the grade points that he/she has maintained. A minimum grade point average is required to be maintained for satisfactory progress. Also, a minimum number of earned credits should be acquired in order to qualify for the degree as prescribed under article 22.

Letter grades and corresponding grade-points will be awarded in accordance with provisions shown below:

Amended Vide A.C Resolution dated 7.9.93 & 13.9.93

Numerical grade	Letter Grade	Grade Point
80% or above	A+ (A plus)	4.0
75% to less than 80%	A (A regular)	3.75
70% to less than 75%	A- (A minus)	3.5
65% to less than 70%	B+ (B plus)	3.25
60% to less than 65%	B (B regular)	3.0
55% to less than 60%	B- (B minus)	2.75
50% to less than 55%	C+ (C plus)	2.5
45% to less than 50%	C (C regular)	2.25
40% to less than 45%	D	2.0
less than 40%	F	0.0
Continuation (for project & thesis /design courses)	X	-

3.12.1 Distribution of Marks

Amended Vide A.C Resolution dated 7.9.93 & 13.9.93

Thirty percent (30%) of marks shall be allotted for continuous assessment i.e, quizzes and homework assignments, in class evaluation and class participation. The remainder of the marks will be allotted to TERM FINAL examination which will be conducted centrally by the University. There will be internal and external examiners for each course in the term Final Examination of 3 hour duration. The distribution of marks for a given course will be as follows:

(i)	Class participation	10%
(ii)	Continuous Assessment (Quizzes, Homework Assignment etc.)	20%
(iii)	Final Examination (3 hours)	70%
	Total	100%

Basis for awarding marks for class participation and attendance will be as follows :

Attendance	Marks
90% and above	10
85% to less than 90%	9
80% to less than 85%	8
75% to less than 80%	7
70% to less than 75%	6
65% to less than 70%	5
60% to less than 65%	4
less than 60%	0

Amended Vide A.C Resolution dated 7.9.93 & 13.9.93

For 2 credit courses 2 best out of 3, for 3 credit courses 3 best out of 4, and for 4 credit courses 4 best out of 5 quizzes may be considered for awarding grade. These may be considered as the minimum recommended number of quizzes for any course. If the number of quizzes administered in a course exceeds these suggested minimum numbers, then two-thirds best of all quizzes may be considered. The scheme of continuous assessment that a teacher proposes to follow for a course will be announced on the first day of classes.

Amended Vide A.C Resolution dated 28-12-98 (effective from 1998-99 session) for newly admitted students of Level I Term I)

"The number of quizzes of a course shall be at least n+1, where n is the number of credits of the course. Evaluation of the performance in quizzes will be on the basis of the best n quizzes. The scheme of continuous assessment that a teacher proposes to follow for a course will be announced on the first day of classes".

3.13. Earned Credits

Amended Vide A.C Resolution dated 7.9.93 & 13.9.93

The courses in which a student has obtained `D' or a higher Grade will be counted as credits earned by him/her. Any course in which a student has obtained `F' grade will not be counted towards his/her earned credits. A student who obtains a `F' grade in any Core Course in any term, he/she will have to repeat the course.

If a student obtains a `F' grade in an Optional Course, he/she may choose to repeat the course or take a substitute course if available.
F grades will not be counted for GPA calculation but will stay permanently on the Grade Sheet and Transcript. When a student will repeat a course in which he/she previously obtained a F grade, he/she will not be eligible to get a grade better than C in such a course.
If a student obtains a grade other than 'F' in a course, he/she will not be allowed to repeat the course for the purpose of grade improvement.

Amended Vide A.C Resolution dated 14.3.96 & 16.4.96

The courses in which a student has obtained 'D' or a higher Grade will be counted as credits earned by him/her. Any course in which a student has obtained 'F' grade will not be counted towards his/her earned credits.
A student who obtains 'F' grade in a Core Course in any term will have to repeat the course.
If a student obtains 'F' grade in an Optional Course he / she may choose to repeat the Course or take a Substitute Course if available.

'F' grades will not be counted for GPA calculation but will stay permanently on the Grade Sheet and Transcript. When a student will repeat a course in which he / she previously obtained 'F' grade, he/she will not be eligible to get a grade better than 'C' in such a course.
If a student obtains 'D' grade in a course, he/she will be allowed to repeat the course for the purpose of grade improvement by foregoing his/her earlier grade, but he/she will not be eligible to get a grade better than 'C' in such a course.
If a student obtains 'C' or a better grade in any course, he/she will not be allowed to repeat the course for the purpose of grade improvement.

Amended Vide A.C Resolution dated 28-12-98 (effective from the term commencing on 6.12.1998 and afterwards).

" 'F' grades will not be counted for GPA calculation but will stay permanently on the Grade Sheet and Transcript. When a student will repeat a course in which he/she previously obtained 'F' grade, he/she will not be eligible to get a grade better than "B" in such a course.

If a student obtains a grade lower than 'B' in a course, he/she will be allowed to repeat the course only once for the purpose of grade improvement by forgoing his/her earlier grade, but he/she will not be eligible to get a grade better than 'B' in such a course. A student will be permitted to repeat for grade improvement purposes a maximum of four courses in B. Sc. Engg. and BURP programs and a maximum of five courses in B Arch program.

If a student obtains 'B' or a better grade in any course, he/she will not be allowed to repeat the course for the purpose of grade improvement."

উপরোক্ত সংশোধনী সমূহ এই বিশ্ববিদ্যালয়ে ১৯৯২ ইং সনে চালুকৃত কোর্স সিষ্টেম এর নিয়মাবলী যাহা সর্ব প্রথম ৩০/৯, ৪/১০, ১৯/১০/৯২ ইং তারিখে অনুষ্ঠিত ২১৪তম একাডেমিক কাউন্সিল অধিবেশনে অনুমোদিত হয় এবং সেই সময় হইতে কার্যকর হইবে।

3.14 Calculation of GPA

Amended Vide A.C Resolution dated 7.9.93 & 13.9.93

Grade Point Average (GPA) is the weighted average of the grade points obtained in all the courses passed/completed by a student. For example, if a student passes/completes five courses in a semester having credits of C_1, C_2, C_3, C_4, and C_5 and his grade points in these courses are G_1, G_2, G_3, G_4, and G_5, respectively then

$$\text{GPA} = \frac{\sum C_i G_i}{\sum C_i}$$

3.14.1 A Numerical Example

Suppose a student has completed five courses in a Term and obtained the following grades:

Amended Vide A.C Resolution dated 7.9.93 & 13.9.93

Course	Credits	Grade	Grade points
EEE 203	3	A+	4.0
EEE 205	3	B	3.0
EEE 207	3	A	3.75
Math 205	2	B+	3.25
Hum 203	1	A-	3.5

Then his GPA for the term will be computed as follows:

$$\text{GPA} = \frac{3(4.0) + 3(3.0) + 3(3.75) + 2(3.25) + 1(3.5)}{(3 + 3 + 3 + 2 + 1)} = 3.52$$

3.15 Student Classification

For a number of reasons, it is necessary to have a definite system by which to classify students as First Year/Freshman, Second Year/Sophomore, Third Year/Junior and Fourth Year/Senior. At BUET, regular students are classified according to the number of credit hours earned towards a degree. The following classification applies to the students.

* *Amended Vide A.C Resolution dated 23.1.2001*

Year/Level	Earned Credit Hours	
	Engineering/URP	Architecture
First Year/Level 1	0 to 36	**0 to 34**
Second Year/Level 2	>36 to 72	**> 34 to 72**
Third Year/Level 3	>72 to 108	**>72 to 110**
Fourth Year/Level 4	>108	**>110 to 147**
Fifth Year/Level 5		**> 147**

3.16 Registration for the Second and Subsequent Terms

A student is normally required to earn at least 15 credits in a Term. At the end of each term, the students will be classified into the following three categories:

Category 1 :
Consisting of students who have passed all the courses prescribed for the term and have no backlog of courses. A student belonging to Category 1 will be eligible to register for all courses prescribed for the next term.

Category 2:
Consisting of students who have earned at least 15 credits in the term but do not belong to category 1. A student belonging to Category 2 is advised to take at least one course less in the next term subject to the condition that he has to register for such backlog courses as may be prescribed by the adviser.

Category 3 :
Consisting of students who have failed to earn 15 credits in the term. A student belonging to Category 3 is advised to take at least two courses less subject to registration for a minimum of 15 credits. However, he will be required to register for such backlog courses as may be prescribed by the adviser.

3.17 Performance Evaluation

The performance of a student will be evaluated in terms of two indices, viz. term grade point average (GPA), and cumulative grade point average (CGPA), which is the grade average for all the terms. The term grade point average is computed dividing the total grade points earned in a term by the number of term hours taken in that term. The overall or cumulative grade point average (CGPA) is computed by dividing the total grade points accumulated up to date by the total credit hours earned. Thus a student who has earned 275 grade points in attempting 100 credit hours of courses would have an overall grade point average of 2.75.

Students will be considered to be making normal progress toward a degree if their cumulative or overall GPA for all work attempted is 2.20 or more. Students who regularly maintain Term GPA of 2.20 or better are making good progress toward their degrees and are in good standing with the university.

Students who fail to maintain this minimum rate of progress will not be in good standing. This can happen when one or more of the following conditions exist:

(i) Term GPA falls below 2.20, or
(ii) Cumulative GPA falls below 2.20
(iii) Earned credits fall below 15 times the Number of Terms Attended/Studied

All such students can make up deficiencies in GPA and credit requirements by completing courses in next term(s) and backlog courses, if there be any, with better grades. When GPA and credit requirements are achieved, the student is returned to good standing.

3.18 Academic Progress, Probation and Suspension

Academic Progress. Undergraduate students will be considered to be making normal progress toward a degree if their cumulative or overall GPA for all work attempted is not less than 2.20.

Probation and Suspension. Undergraduate students who regularly maintain Term GPA of 2.20 or better are making good progress toward their degrees and are in good standing with the university. Students who fail to maintain this minimum rate of progress may be placed on academic probation.

The status of academic probation is a reminder/warning to the student that satisfactory progress towards graduation is not being made. A student may be placed on academic probation when either of the following conditions exist:

(i) the Term GPA falls below 2.20, or
(ii) the cumulative GPA falls below 2.20

Students on probation are subject to such restrictions with respect to courses and extracurricular activities as may be imposed by the respective Dean of faculty.

The minimum period of probation is one Term, but the usual period is for one academic year. This allows the student an opportunity to improve the GPA through the completion of additional course work during the period that the student is on probation. The probation is extended for additional terms until the student achieves an overall GPA of 2.20 or better. When that condition is achieved, the student is returned to good standing.
Academic probation is not to be taken lightly - it is very serious matter. A student on academic probation who fails to maintain a GPA of at least 2.20 during two consecutive academic years may be suspended from this university. A student who has been suspended may petition the Dean of

faculty, but this petition will not be considered until the student has been suspended at least one full Term.

Petitions for reinstatement must set forth clearly the reasons for the previous unsatisfactory academic record and it must delineate the new conditions that have been created to prevent the recurrence of such work. Each such petition is considered individually on its own merits.

After consideration of the petition, and perhaps after consultation with the student, the Dean in some cases, reinstate the student if this is the first suspension. However, a second suspension will be regarded as final and absolute.

3.19 Measures for Helping Academically Weak Students

The following provisions will be made as far as possible to help academically weak students to enable them to complete their studies within the maximum period of seven years in engineering and eight years in architecture students, respectively:

a) All such students whose cumulative grade point average (CGPA) is less than 2.20 at the end of a term may be given a load of not exceeding four courses, in the next term.

b) For other academic deficiencies, some basic and core courses may be offered during the Short Term in order to enable the student to partially make-up for the reduced load during Regular Terms.

Following criteria will be followed for determining academically weak students:

a) CGPA falling below 2.20.
b) Term grade point average (TGPA) falling below 2.20 points below that of previous term.
c) Earned credit falling below 15 times the number of terms attended.

3.20 Special Courses

a) These courses, which include self-study courses, will be from amongst the regular courses listed in the course catalog, a special course can be run only in exceptional cases with the approval of the Syndicate.

Amended Vide a) A.C Resolution dated 28.8.97

These courses, which include self-study courses, will be from amongst the regular theory courses listed in the course catalog, a special course can be run only in exceptional cases.

b) Whether a course is to be floated as a special course will be decided by the Head of concerned department in consultation with the teacher/course co-ordinator concerned if it is required to be offered in Short Term.

Amended Vide b) A.C Resolution dated 28.8.97

b) Whether a course is to be floated as a special course will be decided by the Head of concerned department in consultation with the teacher/course co-ordinator concerned. Decision to float a course as a sepecial course shall be reported to the Academic Council.

c) The special course may be offered to any student in his/her last term if it helps him/her to graduate in that term. It will be offered only if the course is not running in that term as a regular course.

d) Normally no lecture will be delivered for the special course but laboratory/design classes may be held if they form a part of the course. The course coordinator/course teacher will also assign homeworks, administer quizzes and final examination for giving his or her assessments at the end of the term.

e) *A course of weightage up to 6 can be taken as a self-study course.*

Amended Vide A.C Resolution dated 28.8.97.

e) A student will be allowed to register for a maximum of two courses on self study basis.

Added Vide A.C Resolution dated 28-12-98

f) A Special Course Shall not be utilized for grade improvement purposes.

3.21 Minimum Earned Credit and GPA Requirements for Obtaining Graduation

Minimum credit hour requirements for the award of bachelor's degree in engineering and architecture will be decided by the respective Undergraduate Board of Studies. However, at least 157 credit hours for engineering and 190 credit hours for architecture must be earned to be eligible for graduation, and this must include the specified core courses.

**Added vide A.C. Resolution Dated 16.11.1995*

The minimum GPA requirement for obtaining a bachelor's degree in engineering, *URP or architecture is 2.20.

Amended Vide A.C Resolution dated 13.8.97

Completion of fulltime Studentship:
Students who have completed Minimum credit requirement for graduation for a Bachelors degree shall not be considered and registered as fulltime students.

A student may take additional courses with the consent of his/her adviser in order to raise GPA, but he/she may take a maximum of 15 such additional credits in engineering and *URP and 18 such additional credits in architecture beyond respective credit-hour requirements for bachelor's degree during his/her entire period of study.

3.22.1 Application for Graduation and Award of Degree

Amended Vide A.C Resolution dated 7.9.93 & 13.9.93

A student who has fulfilled all the academic requirements for Bachelor's degree will have to apply to the Controller of Examinations through his/her Adviser for graduation. Provisional degree will be awarded on completion of credit and GPA requirements. Such provisional degrees will be confirmed by the Academic Council.

3.23 Industrial/Professional Training Requirements

Depending on each department's own requirement a student may have to complete a prescribed number of days of industrial/professional training in addition to minimum credit and other requirements, to the satisfaction of the concerned department.

3.24 Time Limits for Completion of Bachelor's Degree

**Added vide A.C. Resolution Dated 16.11.1995*

A student must complete his studies within a maximum period of seven years for engineering and *URP and eight years for architecture.

3.25 Inclusion of Repeater from Annual System in Course System

Amended Vide A.C Resolution dated 7.9.93 & 13.9.93

Repeater students including Private students of Annual system will be included in the Course System of curricula as and when such situation will arise.

3. 25.1 Equivalence of Courses and Grades

Amended Vide A.C Resolution dated 7.9.93 & 13.9.93

Equivalence of courses passed previously by any repeater student including Private students shall be determined by the respective BUGS for the purpose of:

(a) allowing course exemption, and

(b) conversion of numberical grades into letter grades in exempted courses.

3. 25.2 Exemption of Courses

Amended Vide A.C Resolution dated 7.9.93 & 13.9.93

Repeater students including private students may be granted exemption in theoretical course(s) in which he secured 45% or more marks and in sessional/laboratory course(s) in which he secured 41% or more marks.

Amended Vide A.C Resolution dated 21.11.93

প্রস্তাবিত বিষয়ে বিস্তারিত আলোচনার পর সিদ্ধান্ত হয় যে, পুরাতন পদ্ধতিতে অকৃতকার্য্য হইয়া কোর্স পদ্ধতিতে অন্তর্ভূক্ত হওয়া ছাত্র/ছাত্রীগণ থিউরী/সেশনাল কোন বিষয়ে ৪০% বা ততোধিক নম্বর প্রাপ্ত হইলে তাহাদিগকে অব্যাহতি (Exemption) প্রদান করা যাইতে পারে। এই অব্যাহতির জন্য কোন আবেদনের প্রয়োজন হইবে না।

3. 25.3 Time Limit for Completion of Bachelor's Degree

Time allowed for a student included in Course System form Annual System to complete studies leading to a bachelor's degree will be proportional to the remaining credits to be completed by him/her.

Amended Vide A.C Resolution dated 7.9.93 & 13.9.93

A student in engineering, for example, having earned 40 credit hours through equivalence and exemption (of previously completed courses) out of a total requirement of 160 credits for bachelor's degree will get (7 yrs X 120/160 = 5.25) = 5 1/2 years (rounded to next higher half-a-year) or 11 (eleven) Regular Terms to fulfill all requirements for bachelor's degree. For a student in architecture time allowed will be calculated in a similar way.

3. 25.4 Relaxation of course registration for student transferred to course system from annual system

Amended Vide A.C Resolution dated 17-10-93 & 27-10-93

The requirement of registrations of a minimum 15 credit hours in a term shall be waived for only the terms of the level where he/she has been transferred in course system provided that he/she has been granted exemption in some of the courses offered in those terms.

3. 26 Attendance, Conduct, Discipline etc.

3.26.1 Attendance

Amended Vide A.C Resolution dated 7.9.93 & 13.9.93

All students are expected to attend classes regularly. The university believes that attendance is necessary for effective learning. The first responsibility of a student is to attend classes regularly, and one is required to attend at least 60% of all classes held in every course.

3.26.2 Conduct and Discipline

A student shall conform to a high standard of discipline, and shall conduct himself, within and outside the precincts of the university in a manner befitting the students of an university of national importance. He shall show due courtesy and consideration to the employees of the university and Halls of Residence, good neighborliness to his fellow students and the teachers of the university and pay due attention and courtesy to visitors.

To safeguard its ideals of scholarship, character and personal behaviour, the university reserves the right to require the withdrawal of any student at any time for any reason deemed sufficient.

3.27 Absence During Term

A student should not be absent from quizzes, tests, etc. during the Term. Such absence will naturally lead to reduction in points/marks which count towards the final grade. Absence in Term Final Examination will result in 'F' grades.

A student who has been absent for short periods, up to a maximum of three weeks due to illness, should approach the course teacher(s) or the course coordinator(s) for a make-up quizzes or assignments immediately on returning to the classes. Such request should be supported by medical certificate from a university medical officer. The medical certificate issued by a registered medical practitioner (with the Registration Number shown explicitly on the certificates) will also be acceptable only in those cases where the student has valid reasons for his absence from the university.

3.28 Assignment of credits

i. *Theoretical courses*: One lecture per week per term will be equivalent to one credit

ii. *Laboratory / sessional / design courses*: Credits for laboratory, sessional or design courses will be half of the class hours per week per term

Credits are also assigned to project and thesis work taken by students. The amount of credits assigned to such work may vary from one discipline to another.

The curriculum does not demand the same rate of academic progress from all students for obtaining the degree but only lays down the pace expected of a normal student. A student whose background or capacity for assimilation is lower will be permitted to complete the program at a slower pace by studying a lesser number of courses during a given term (subject to a minimum course load). He may keep pace with his class by taking during the short term those courses which he had dropped during the regular terms, or by covering the entire degree program over an extended period without developing any feeling of inferiority complex.

4.0 Honours

Candidates for Bachelor's degree in engineering and architecture will be awarded the degree with honours if their overall GPA is 3.75 or better.

4.1 Dean's list

Amended Vide A.C Resolution dated 7.9.93 & 13.9.93	As a recognition of excellent performance, the names of students obtaining an average GPA of 3.75 or above in two regular terms of an academic year may be published in the Dean's List in each Faculty. Students who have received F grade in any course during any of the two regular terms will not be considered for Dean's List in that year.
Vide A.C Reslution dated 9.3.94 & 11.4.94	(2) Term system নিয়মাবলীর 13.1 ধারায় যে সকল ছাত্রের ২টি নিয়মিত Term এর G.P.A কমপক্ষে 3.75 হইবে তাহাদের নাম Dean List G প্রকাশ করার বিষয়ে উল্লেখ আছে। এই ক্ষেত্রে ব্যাখ্যা হইল ২টি টার্মের G.P.A দুইটির গড় 3.75 বা ততোধিক হইবে। "The students whose G.P.A will fall below 2.20 will have to be notified so that the necessary remedial measures can be taken"

4.2 *Dr. V. G. Desa Gold Medal*

Dr. V. G. Desa Gold Medal for Outstanding Mechanical Engineering Graduates was introduced in 1994. The medal will be presented to the student who secured first position during the graduating years and whose CGPA is more than 3.75. The student must have completed his/her undergraduate course within four consecutive academic years and have a satisfactory attendence to his credit.

5.0 COURSE REQUIREMENTS FOR UNDERGRADUATE MECHANICAL ENGINEERING STUDENTS

Undergraduate students of this department have to follow the course schedule given below. The letter prefix in any course number indicates the department offering the course viz. ME for Mechanical Engineering, MME for Metallurgical Engineering, IPE for Industrial and Production Engineering, EEE for Electrical and Electronics Engineering, Chem for Chemistry, Phy for Physics, Math for Mathematics, Hum for Humanities and Shop for Workshops. The first digit in the number indicates the level for which the course is intended. Odd numbered courses are theory courses and even numbered courses are sessional courses.

The termwise distributions of course of different levels are listed below.

5.1 Term-wise Course Curricula for B. Sc. Engg. (Mech) degree

(APPROVED IN ACADEMIC COUNCIL MEETING NO. 409, HELD ON: 10/12/2014, RESOLUTION NO. A 140718)

LEVEL - 1, TERM - I

Course No	Course Name	Type of Course	Contact hours	Credit Hours
Phy 105	Structure of Matter, Electricity and Magnetism and Modern Physics	Theory	3	3.00
Chem 109	Chemistry - I	Theory	3	3.00
Math 161	Differential Calculus, Solid Geometry and Vectors	Theory	4	4.00
ME 101	Introduction to Mechanical Engineering	Theory	3	3.00
EEE 159	Fundamentals of Electrical Engineering	Theory	3	3.00
			16	16.00
Chem 114	Inorganic Quantitative Analysis Sessional	Sessional	3	1.50
EEE 160	Fundamentals of Electrical Engineering Sessional	Sessional	3/2	0.75
Shop 160	Foundry and Welding Shops	Sessional	3/2	0.75
ME 160	Mechanical Engineering Drawing -I	Sessional	3	1.50
			9	4.50
Contact hours : 25.0 ; Credit hours : 20.50				

LEVEL - 1, TERM - II

Course No	Course Name	Type of Course	Contact hours	Credit Hours
Phy 159	Waves and Oscillation, Geometrical Optics and Wave Mechanics	Theory	3	3.00
Chem 141	Chemistry of Engineering Materials	Theory	3	3.00
Math 163	Integral Calculus and Differential Equations	Theory	4	4.00
ME171	Computer Programming Language	Theory	3	3.00
Hum[2]	Select from the prescribed courses	Theory	3	3.00
			16	16.00
Phy 102	Physics Sessional	Sessional	3	1.50
ME172	Computer Programming Language Sessional	Sessional	3	1.50
Shop 170	Machine Shop Practice	Sessional	3/2	0.75
			7.5	3.75
Contact hours: 23.5; Credit hours: 19.75				

LEVEL - 2, TERM - I

Course No	Course Name	Type of Course	Contact hours	Credit Hours
ME 247	Engineering Mechanics-I	Theory	3	3.00
EEE 259	Electrical and Electronics Technology	Theory	4	4.00
Math 261	Vector Calculus, Matrices, Laplace Transform and Series Solution	Theory	4	4.00
ME 203	Engineering Thermodynamics	Theory	3	3.00
Hum[2]	Select from the prescribed courses	Theory	3	3.00
			17	17.00
EEE 260	Electrical and Electronics Technology Sessional	Sessional	3	1.50
ME 204	Engineering Thermodynamics Sessional	Sessional	3/2	0.75
			4.5	2.25
Contact hours: 21.5; Credit hours: 19.25				

LEVEL - 2, TERM - II

Course No	Course Name	Type of Course	Contact hours	Credit Hours
MME 291	Metallic Materials	Theory	3	3.00
ME 261	Numerical Analysis	Theory	3	3.00
ME 243	Mechanics of Solids	Theory	3	3.00
Math 263	Complex Variables, Harmonic Analysis and Partial Differential Equations	Theory	4	4.00
ME 249	Engineering Mechanics-II	Theory	3	3.00
			16	16.00
MME 292	Metallic Materials Sessional	Sessional	3	1.50
ME 262	Numerical Analysis Sessional	Sessional	3/2	0.75
ME 244	Mechanics of Solids Sessional	Sessional	3/2	0.75
ME 260	Mechanical Engineering Drawing -II	Sessional	3	1.50
			9.0	4.50
Contact hours: 25.0; Credit hours: 20.50				

LEVEL - 3, TERM - I

Course No	Course Name	Type of Course	Contact hours	Credit Hours
IPE 331	Production Processes	Theory	4	4.00
ME 321	Fluid Mechanics - I	Theory	3	3.00
ME 349	Mechanics of Machinery	Theory	3	3.00
ME 305	Heat Transfer	Theory	3	3.00
ME 361	Instrumentation and Measurement	Theory	3	3.00
			16	16.00
IPE 332	Production Process Sessional	Sessional	3/2	0.75
ME 350	Mechanics of Machinery Sessional	Sessional	3	1.5
ME 306	Heat Transfer Sessional	Sessional	3/2	0.75
ME 366	Electro-Mechanical System Design and Practice	Sessional	3	1.50
			9	4.50
Contact hours: 25.0; Credit hours: 20.50				

LEVEL - 3, TERM - II

Course No	Course Name	Type of Course	Contact hours	Credit Hours
HUM[2]	Select from the prescribed courses	Theory	3	3.00
ME 323	Fluid Mechanics - II	Theory	3	3.00
ME 351	Machine Design	Theory	4	4.00
IPE 381	Measurement and Quality Control	Theory	3	3.00
ME 307	Heat Transfer Equipment Design	Theory	3	3.00
			16	16.00
ME 326	Fluid Mechanics Sessional	Sessional	3/2	0.75
ME 352	Machine Design Sessional	Sessional	3	1.50
IPE 382	Measurement and Quality Control Sessional	Sessional	3/2	0.75
ME 310	Thermo Fluid System Design	Sessional	3	1.50
ME 370	Industrial Training	Training	4 weeks	*
			9.0	4.50
Contact hours: 23.5; Credit hours: 20.50				

* *Non-credit course. Performance is judged either by 'S' for satisfactory or 'U' for unsatisfactory.*

LEVEL - 4, TERM - I

Course No	Course Name	Type of Course	Contact hours	Credit Hours
ME 421	Fluid Machinery	Theory	3	3.00
IPE 431	Machine Tools	Theory	3	3.00
ME 417	Internal Combustion Engines	Theory	3	3.00
Optional-I[3]	Selected from prescribed optional subjects	Theory	3	3.00
Optional-II[3]	Selected from prescribed optional subjects	Theory	3	3.00
			15	15.00
ME 422	Fluid Machinery Sessional	Sessional	3/2	0.75
IPE 432	Machine Tools Sessional	Sessional	3/2	0.75
ME 418	Heat Engines Sessional	Sessional	3/2	0.75
ME 400	Project and Thesis	Sessional	6	3.00
			10.5	5.25
Contact hours: 25.5; Credit hours: 20.25				

LEVEL - 4, TERM - II

Course No	Course Name	Type of Course	Contact hours	Credit Hours
ME 419	Power Plant Engineering	Theory	3	3.00
Optional –III[3]	Selected from prescribed optional subjects	Theory	3	3.00
Optional –IV[3]	Selected from prescribed optional subjects	Theory	3	3.00
Optional – V[3]	Selected from prescribed optional subjects	Theory	3	3.00
IPE 481	Industrial Management	Theory	4	4.00
			16	16.00
ME 420	Power Plant Engineering Sessional	Sessional	3/2	0.75
ME 400	Project and Thesis	Sessional	6	3.00
			7.5	3.75
Contact hours: 23.5; Credit hours: 19.75				

Notes:

[2] Students can choose from a number of humanities courses as follows, offered by Humanities Department:

Hum 101 : English
Hum 103 : Economics
Hum 201 : Sociology
Hum 203 : Government
Hum 303 : Principles of Accounting
Hum 307 : Industrial Sociology

[3] Students can choose from optional courses offered by the Department of Mechanical Engineering or from those offered by the Department of Industrial and Production Engineering.

The minimum credit hours requirement for B. Sc. Engg. (Mech.) degree is 161.0.

(APPROVED IN ACADEMIC COUNCIL MEETING NO. 409, HELD ON: 10/12/2014, RESOLUTION NO. A 140718)

5.2 Contact Hours and Credit Hours in Eight Terms

Level Term	Contact hours for theory courses	Contact hours for Sessional courses	Cumulative contact hours	Cumulative credit hours
1-I	16.0	9.0	25.0	20.50
1-II	16.0	7.5	48.5	40.25
2-I	17.0	4.5	70.0	59.50
2-II	16.0	9.0	95.0	80.00
3-I	16.0	9.0	120.0	100.50
3-II	16.0	9.0	145.0	121.00
4-I	15.0	10.5	170.5	141.25
4-II	16.0	7.5	194.0	161.00
Total	128.0	66.0	194.0	161.00

5.3 Distribution of Credit Hours for Different Categories of Courses

Level-Term	Humanities (credit hr.)	Mathematics (credit hr.)	Basic Science (credit hr.)	Departmental Engineering (credit hr.)	Allied Engineering (credit hr.)	Optional Courses (Credit hr.)
1-I	-	4+0	6+1.5	3+2.25	3+0.75	-
1-II	3+0	4+0	6+1.5	3+2.25	-	-
2-I	3+0	4+0	-	6+0.75	4+1.5	-
2-II	-	4+0	-	9*+3	3+1.5	-
3-I	-	-	-	12+3.75	4+0.75	-
3-II	3+0	-	-	10+3.75	3+0.75	-
4-I	-	-	-	6+4.5	3+0.75	6**+0
4-II	-	-	-	3+3.75	4+0	9**+0
Total	9+0	16+0	12+3	52+23.25	24+6	15+0
% of total theory courses	7.03	12.50	9.38	40.63	18.75	11.72
% of total theory courses considering notes below	10.16	14.84	9.36	38.28	15.63	11.54

* 3 credit hours of which is a mathematics course (ME 261) offered by ME Dept.

** Students can take courses offered by ME and/or IPE Dept.

5.4 Courses Offered by ME Department to ME Students (Core Courses)

Course No	Course Name	Level /Term	Contact Hours	Credit Hours
ME 101	Introduction to Mechanical Engineering	1-I	3.0	3.00
ME 160	Mechanical Engineering Drawing - I	1-I	3.0	1.50
Shop 160	Foundry and Welding Shops	1-I	3/2	0.75
ME 171	Computer Programming Language	1-II	3.0	3.00
ME 172	Computer Programming Language Sessional	1-II	3/2	0.75
Shop 170	Machine Shop Practice	1-II	3/2	0.75
ME 203	Engineering Thermodynamics	2-I	3.0	3.00
ME 204	Engineering Thermodynamics Sessional	2-I	3/2	0.75
ME 247	Engineering Mechanics-I	2-I	3.0	3.00
ME 243	Mechanics of Solids	2-II	3.0	3.00
ME 244	Mechanics of Solids Sessional	2-II	3/2	0.75
ME 260	Mechanical Engineering Drawing-II	2-II	3.0	1.50
ME 261	Numerical Analysis	2-II	3.0	3.00
ME 262	Numerical Analysis Sessional	2-II	3/2	0.75
ME 249	Engineering Mechanics-II	2-II	3.0	3.00
ME 305	Heat Transfer	3-I	3.0	3.00
ME 306	Heat Transfer Sessional	3-I	3/2	0.75
ME 321	Fluid Mechanics -I	3-I	3.0	3.00
ME 349	Mechanics of Machinery	3-I	3.0	3.00
ME 350	Mechanics of Machinery Sessional	3-I	3.0	1.50
ME 361	Instrumentation and Measurement	3-I	3.0	3.00
ME 366	Electro-Mechanical System Design and Practice	3-I	3.0	1.50
ME 307	Heat Transfer Equipment Design	3-II	3.0	3.00
ME 310	Thermo-Fluid System Design	3-II	3.0	1.50
ME 323	Fluid Mechanics-II	3-II	3	3.00
ME 326	Fluid Mechanics Sessional	3-II	3/2	0.75
ME 351	Machine Design	3-II	4.0	4.00
ME 352	Machine Design Sessional	3-II	3.0	1.50
ME 417	Internal Combustion Engines	4-I	3	3.00
ME 418	Heat Engines Sessional	4-I	3/2	0.75
ME 421	Fluid Machinery	4-I	3.0	3.00
ME 422	Fluid Machinery Sessional	4-I	3/2	0.75
ME 400	Project and Thesis	4-I	6.0	3.00
ME 419	Power Plant Engineering	4-II	3.0	3.00
ME 420	Power Plant Engineering Sessional	4-II	3/2	0.75

5.5 Courses Offered by ME Department to ME Students (Optional Courses)

Course No	Course Name	Level-Term	Contact Hours	Credit Hours
ME 407	Advanced Thermodynamics	4-I or 4-II	3.0	3.00
ME 409	Renewable Energy	4-I or 4-II	3.0	3.00
ME 411	Combustion and Pollution	4-I or 4-II	3.0	3.00
ME 413	Energy and Environment	4-I or 4-II	3.0	3.00
ME 415	Refrigeration and Building Mechanical System	4-I or 4-II	3.0	3.00
ME 423	Fluids Engineering	4-I or 4-II	3.0	3.00
ME 425	Aerodynamics	4-I or 4-II	3.0	3.00
ME 427	Applied Engineering Mathematics	4-I or 4-II	3.0	3.00
ME 429	Similitude in Engineering Mechanics	4-I or 4-II	3.0	3.00
ME 431	Gas Dynamics	4-I or 4-II	3.0	3.00
ME 433	Fluidics	4-I or 4-II	3.0	3.00
ME 437	Design of Fluid Machines	4-I or 4-II	3.0	3.00
ME 439	Biomedical Fluid Mechanics	4-I or 4-II	3.0	3.00
ME 441	Theory of Structures	4-I or 4-II	3.0	3.00
ME 445	Noise and Vibration	4-I or 4-II	3.0	3.00
ME 447	Robotics	4-I or 4-II	3.0	3.00
ME 449	Composite Materials	4-I or 4-II	3.0	3.00
ME 461	Control Engineering	4-I or 4-II	3.0	3.00
ME 463	Petroleum Engineering	4-I or 4-II	3.0	3.00
ME 465	Applied Statistics	4-I or 4-II	3.0	3.00
ME 467	Automobile Engineering	4-I or 4-II	3.0	3.00
ME 469	Nuclear Engineering	4-I or 4-II	3.0	3.00
ME 471	Bio-Engineering	4-I or 4-II	3.0	3.00
ME 473	Plastics Process Technology	4-I or 4-II	3.0	3.00
ME 475	Mechatronics	4-I or 4-II	3.0	3.00
ME 481	Textile Technology	4-I or 4-II	3.0	3.00

6.0 DETAIL OUTLINE OF UNDERGRADUATE COURSES OFFERED BY ME DEPARTMENT TO ME STUDENTS

(APPROVED IN ACADEMIC COUNCIL MEETING NO. 409, HELD ON: 10/12/2014, RESOLUTION NO. A 140718)

ME 101 : Introduction to Mechanical Engineering

3.00 Credit Hours

Scope of mechanical engineering; Study of sources of energy-conventional and renewable; Environmental pollution.

Major mechanical applications: Automobiles and I.C. enginees; Gas turbine and jet engines; Fluid machinery-Fan, blower, compressor, pump; Steam generators and turbines;Refrigeration and air-conditioning systems.

Electromechanical systems- Robotics, Mechatronics, MEMS, Bioengineering;

Machine elements: Gears, bearings, spring, beam, column; Materials for mechanical engineers.

Engineering codes and standards; Engineering ethics and occupational safety.

ME 160 : Mechanical Engineering Drawing - I

1.50 Credit Hours

Introduction; Instruments and their uses; First and third angle projections; Orthographic drawings; Isometric views; Missing lines and views; Sectional views and conventional practices; Auxiliary views.

ME 171 : Computer Programming Language

3.00 Credit Hours

Introduction to computer hardware and its working principle; Programming logic, algorithms, and flowcharts.

Introduction to structured programming; Overview of C and C++ programming languages; C and C++ fundamentals – data types and expressions; Operators; Libraries and keywords; Statements; Arrays and strings; Functions; Control statements; Pointers; Input and output systems, Object Oriented programming; Introduction to advanced programming.

ME 172 : Computer Programming Language Sessional

1.50 Credit Hours

Sessional based on ME 171.

ME 203 : Engineering Thermodynamics

3.00 Credit Hours

Fundamental concepts; Energy, energy transfer and first law of thermodynamics; Properties of pure substances; Energy analysis of control mass and control volume system; Second law of thermodynamics; Entropy and exergy analysis; Thermodynamic relations; Carnot cycle, Gas power cycles: Ideal cycles, Otto cycle, diesel cycle, Brayton cycle; Vapor power cycle; Refrigeration cycle; Mixture of gases and vapors; Phychrometry.

ME 204 : Engineering Thermodynamics Sessional

0.75 Credit Hours

Sessional based on ME 203.

ME 243 : Mechanics of Solids

3.00 Credit Hours

Stress analysis: axially loaded member, statically indeterminate problems, thermal and centrifugal stresses; Stresses in thin and thick walled cylinders and spheres.

Beams: shear force and bending moment diagrams; Stresses in beams; Flexure formula; Deflection of beams: integration and area moment methods; Flexure formula of curved beams. Introduction to reinforced concrete beams.

Torsion formula; Angle of twist; Helical springs.

Columns: Euler’s formula, intermediate column formulas, the Secant formula.

Combined stresses: principal stress, Mohr's Circle; Strain energy; failure theories; Introduction to experimental stress analysis techniques.

ME 244 : Mechanics of Solids Sessional

0.75 Credit Hours

Experiments based on ME 243.

ME 247 : Engineering Mechanics-I

3.00 Credit Hours

Basic concepts of mechanics; Statics of particles and rigid bodies; Centroids of lines, areas and volumes; Forces in struss, frames, and machines; Forces in Cables; Friction, Power transmission by belts and ropes; Moments of inertia of areas and masses; Method of virtual work.

ME 249 : Engineering Mechanics-II

3.00 Credit Hours

Kinematics of particles: Kinetics of particles: Newton's second law, energy and momentum method; System of particles; Kinematics of rigid bodies; Plane motion of rigid bodies: forces and acceleration, Energy and momentum methods; Velocity and acceleration in mechanism.

ME 260 : Mechanical Engineering Drawing - II

1.50 Credit Hours

Review of orthographic projections; Fasteners, gears, keys and springs; Sectional views and conventional practices; Auxiliary views; Specifications for manufacture; Working drawings; Plan and elevation of building; Computer graphics.

ME 261 : Numerical Analysis

3.00 Credit Hours

Roots of polynomials and transcendental equations; Determinants and matrices; Eigen values and eigen vectors; Solution of linear and non-linear algebraic equations; Solution of first-order differential equations.

Interpolation methods; Numerical differentiation and integration; Solving equations by finite differences; Curve fitting.

ME 262 : Numerical Analysis Sessional

0.75 Credit Hours

Numerical solution of problems in Engineering; Introduction to Computer Aided Design (CAD).

ME 305 : Heat Transfer

3.00 Credit Hours

Basic modes of heat transfer; General conduction equation; Steady state conduction in different geometries and composite structures; Thermal contact resistance; Unsteady heat conduction in solids; Laws of radiation heat transfer; Radiation shape factor; Radiation interchange between two surfaces; Gas radiation; Heat and momentum transfer assoiated with laminar and turbulent flows of fluids in forced convection; Velocity and thermal boundary layer developments in tubes (ducts) and over flat plate; Natural convection heat transfer; Heat transfer mechanism with change of phase; Boiling and condensation: mechanism and heat transfer correlations; Mechanism of mass transfer by diffusion, convection and change of phase; Analogy between heat and mass transfer.

ME 306 : Heat Transfer Sessional

0.75 Credit Hours

Sessional based on ME 305.

ME 307 : Heat Transfer Equipment Design

3.00 Credit Hours

Concept of thermal system design: Heat transfer requirements: Mechanical design: Design parameters: Materials, cost and economics: Safety and reliability: Choice and availability; Optimization: Cyclic service.

Heat transfer from finned surface: Basic fin design, Types of fins: Fin Performance, Efficiency of fins, Equation of heat transfer from fins, Analysis of unsteady heat conduction.

Basic thermal design methods of heat exchangers: Types of heat exchangers; Parallel flow, counter flow, cross flow, shell-and-tube, mixed and unmixed, single and multiple pass, compact heat exchangers: Thermo-fluid characteristics: Sizing of heat exchangers; Fouling of heat exchangers: Performance of heat transfer equipment; The log mean temperature difference: Effectivenes-NTU method; F correction factor.

Two-phase heat transfer equipment: Boiler, Evaporator, Condenser, Cooling tower.

Thermal systems with internal heat source: Modeling of thermal equipment.

ME 310 : Thermo-Fluid System Design

1.50 Credit Hours

In this course students are required to undertake a design of a thermo-fluid system. Based on the knowledge gained in the relevant courses, the students need to make a group effort for a thermo-fluid system design. The system design should involve the following stages: concept, design, calculation, component selection, specification preparation, and presentation. Costing and availability should be considered.

ME 321 : Fluid Mechanics - I

3.00 Credit Hours

Fundamental concept of fluid as a continuum; Fluid properties.

Fluid statics: basic hydrostatic equation, pressure variation in static incompressible and compressible fluids; Manometers; Forces on submerged plane and curved surfaces; Buoyant force; Stability of floating and submerged bodies; Pressure distribution of a fluid in rotating and accelerating systems.

Fluid dynamics: Concepts of system and control volume; Continuity, momentum and energy equations and their appliacations; Introduction to Navier-Stokes equations.

Introduction to inviscid incompressible flow. Pressure, Velocity and Flow measurement devices.

ME 323 : Fluid Mechanics - II

3.00 Credit Hours

Dimensional analysis and similitude; Real fluid flow: head losses in pipes and fittings; Flow in multiple-pipe systems.

Introduction to boundary layer; Displacement, momentum and energy thicknesses; Lift and Drag forces on immersed bodies.

Compressible flow; Speed of sound wave; Stagnation states for the flow of an ideal gas; Flow through converging-diverging nozzles; Normal shock.

Open channel flow; Best hydraulic channel cross-sections; Hydraulic jump; Specific energy; Critical depth.

ME 326 : Fluid Mechanics Sessional

0.75 Credit Hours

Experiments based on ME 321 and ME 323.

ME 349 : Mechanics of Machinery

3.00 Credit Hours

Mechanisms; Turning moment: inertia and kinetic energy of reciprocating and rotating parts: Static and dynamic balancing: rotating and reciprocating parts, multi-cylinder in-line and V-engines, radial engines, and opposed-piston engines; Balancing machines.

Types of vibration: Longitudinal, transverse and torsional vibrations; Undamped free vibrations with one and two degrees of freedom; Damped free and forced vibrations with single degree of freedom; Whirling of shafts and rotors; Vibration of geared systems; Vibration absorption, isolation and disolation; Vibration measuring instruments.

Study of cams and cam followers; Clutches and brakes; Dynamometers. Study of gears and gear trains; Gyroscopes: principles and applications.

ME 350 : Mechanics of Machinery Sessional

1.50 Credit Hours

Sessional based on ME 349.

ME 351 : Machine Design

4.00 Credit Hours

Introduction to design; Stress analyses; Deflection and stiffness considerations; Shock and impact; Column design; Statistical considerations; Types of fits; Design for static strength; Design for fatigue strength; Fracture mechanics in design; Design of screws and welded joints.

Design of mechanical springs; rooling contact bearings, lubrication and journal bearings, spur, helical, worm and bevel gears, shafts, rope, belt and chain drives.

ME 352 : Machine Design Sessional

1.50 Credit Hours

Sessional based on ME 351.

ME 361 : Instrumentation and Measurement

3.00 Credit Hours

Basic principles of measurements; Characterisation and behaviour of typical measuring systems; Uncertainty analysis; Different types of sensing elements; Signal conditioning; Applied measurements: displacement, motion, vibration, sound, pressure, flow, temperature, heat flux, force, torque and strain; Data acquisition, transmission and recording methods.

ME 366 : Electro-Mechanical System Design and Practice

1.50 Credit Hours

In this course students are required to undertake a design of a small electro-mechanical or instrumentation system involving sensors, actuations, signal conditioning, feed-back etc. The system design would involve the stages of concept, calculations, fabrication, presentation and demonstration of product. Use of locally available prospects materials will be emphasized.

ME 400 : Project and Thesis

6.00 Credit Hours

In this course, students are required to undertake a major project in engineering analysis, design development of research. The objective is to provide an opportunity to develop initiative, self reliance, creative ability and engineering judgment. The results must be submitted in a comprehensive report with appropriate drawings, charts, bibliography, etc. along with products if any. Use of locally available materials in manufacturing and feasibility study of local industrial units will be emphasised.

ME 407 : Advanced Thermodynamics

3.00 Credit Hours

Introduction to classical and statistical viewpoints in thermodynamics; Concepts of equilibrium, stability, reversibility, irreversibility and availability; Concepts of entropy; Principle of increase of entropy; Calculation of entropy changes; Statistical interpretation; Entropy of mixing; Absolute entropy; Entropy flow and entropy production; Properties of pure substances; Ideal gases; Ideal gas mixtures of constant composition; Ideal gas mixtures of variable compositions; Thermodynamic potentials: Helmholtz free energy functions, Gibbs free energy function; Application of free energy functions; Transformations and thermodynamic potentials; Maxwell relations; Phase transitions; The Clausius-Clapeyron equation; Statistical mechanics: fundamental principles, energy states and levels; Thermodynamic probability:

Bose-Einstein statistics, Fermi-Dirac statistics; Thermodynamic properties of a system; Special Topics: elastic systems, fuel cells, magnetic systems, thermo-electricity.

ME 409 : Renewable Energy
3.00 Credit Hours

Reserves of non-renewable fuels; Prospects of renewable energy, and its sources and pattern of usage; characteristics of renewable sources: intermittent, low power density etc.; use of renewables in small scale systems;

Current technology: wind wave, tidal, passive and active solar, biological and examples of devices; Energy management, interaction of non-technical requirements (social, economic, political, environment) in engineering design and innovation; case-study.

ME 411 : Combustion and Pollution

3.00 Credit Hours

Introduction to combustion; Heat of reaction, adiabatic flame temperature, heating values, chemical composition of products of combustion; Chemistry and kinetics of reactions; Reaction rate and flame propagation; Structure of laminar premixed flames; Explosions and fuel oxidation; Detonation; Combustion in internal and external combustion engines.

Production of pollutants in combustion systems; Emissions of green house gases, carbon monoxide, oxides of nitrogen and sulphur, and other pollutants.

Pollution control: post-engine exhaust treatment for emission control - thermal reactors, exhaust gas recirculation, catalysis; Pollution control by modification of combustion parameters; Other pollution control strategies.

ME 413: Energy And Environment

3.00 Credit Hours

Energy sources and utilization; Principles of energy conversion and storage.

Building thermal energy-principles and optimization; Energy economy tools and techniques; Environmental impacts of energy conversion; Environmental economics and management; Case studies.

ME 415 : Refrigeration and Building Mechanical Systems

3.00 Credit Hours

Concept of refrigeration and its applications; Different refrigeration methods; Analysis of vapour compression refrigeration, absorption refrigeration and air-cycle refrigeration systems; Refrigerants; Refrigeration equipment: compressors, condensers, evaporators, expansion devices, other control and safety devices; Multi-evaporator, multi-compressor systems; Low temperature refrigeration.

Concept of air conditioning and its uses; Cooling load calculation; Psychrometric analysis; Air conditioning systems; Air distribution systems;

Duct design methods; Air conditioning equipment; Application criteria; Control systems.

Fire Hazards; Fire fighting equipment; Vertical transportation, its system design; Escalators and moving ramps.

ME 417 : Internal Combustion Engines

3.00 Credit Hours

Introduction: basic engine types, operation and testing; Idealized cycles and processes; IC engine Fuels: Stoichiometry, properties and tests; Combustion: SI engine, CI engine and gas turbines; Exhaust gas analysis and air pollution: pollution formation mechanism, measurement and control; Fuel metering: SI engines, CI engines; Air capacity of engines: two and four stroke cycles, naturally aspirated and supercharged; IC engine cooling and lubrication systems; Performance and design: Naturally aspirated engines and supercharged engines, design considerations, application of principle of similitude in engine design.

ME 418 : Heat Engines Sessional

0.75 Credit Hours

Sessional based on ME 417.

ME 419 : Power Plant Engineering

3.00 Credit Hours

Overview of power system: generation, transmission and distribution; Power generation options; Global power generation scenario; Survey of power plants in Bangladesh.

Variable load problem; Economic analysis of power plants.
Diesel and gas engine power plants: Components and performance; Gas turbine power plants: components, materials, performance, and cooling; Thermal power plants: fuel, combustion equipment, steam generator, gas and water loops, steam turbines, cycle analysis; Combined cycle power plants: cogeneration.
Hydro-electric power plants: site selection, components of the plant, governing of water turbine.
Nuclear power plant: components, types of reactors, layout of nuclear power plant, safety and waste disposal.
Generator cooling; Governing and control of power plants; Environmental impact of power generation; Clean coal technologies.

ME 420 : Power Plant Engineering Sessional

0.75 Credit Hours

Sessional based on ME 419.

ME 421 : Fluid Machinery

3.00 Credit Hours

Types of fluid machinery; Rotodynamic and positive displacement machines; Velocity diagrams and Euler pump/turbine equation; Impulse and reaction turbines; Centrifugal and axial flow pumps; Deep well turbine pumps; Dimensional analysis applied to fluid machinery: specific speed, unit power, unit speed, unit discharge; Performance and characteristics of turbines and pumps; System analysis and selection of pumps and turbines; Design of pumps; Cavitation; Reciprocating pump, gear and screw pumps; Fans, blowers and compressors; Hydraulic transmission: fluid coupling and torque converter.

ME 422 : Fluid Machinery Sessional

0.75 Credit Hours

Sessional based on ME 421.

ME 423 : Fluids Engineering

3.00 Credit Hours

Conservation of mass, momentum and energy; Derivation of Navier Stokes equations; Steady and unsteady flows; Flow in 2-D and axisymmetric ducts; Laminar jets; Stability of laminar flow; Orr-Sommerfield equation; Flow in branching pipe systems; Unsteady flow in pipes; Water hammer; Economics of pipe systems; Hydraulic machines: press, intensifier, ram, jigger, lift, jack.

ME 425 : Aerodynamics

3.00 Credit Hours

Inviscid incompressible flow to include potential function, stream function, circulation and basic flows; Kutta Joukowski theorem; Aerofoil theory and wing theory.

Drag, aircraft propulsion and propeller; Static performance problem; Special performance problem; Introduction to stability and control, Longitudinal stability and control; Lateral and directional stability and control.

ME 427 : Applied Engineering Mathematics

3.00 Credit Hours

Non-linear differential equations: asymptotic method, perturbation method, Rayleigh-Ritz method, collocation method; Finite difference method; Finite element method; Boundary element method; Calculus of variations; Chaos theory.

ME 429 : Similitude in Engineering Mechanics

3.00 Credit Hours

Reduction of physical problems: similarity rules revealed by dimensional analysis; Supplementary information; Self-similar solutions by dimensional analysis and other groups of transformations; Applications to fluid mechanics and other fields; Local solution and their uses; Self-similar solutions with concealed exponent.

ME 431 : Gas Dynamics

3.00 Credit Hours

One dimensional flow with area change, friction and heat transfer; Flow in converging-diverging nozzles; Governing compressible flow equations, Transonic flow; Stationary, detached and moving shocks; Generation of shocks over wedge and its expansion; supersonic and hypersonic flows; shock interaction in supersonic flows.

ME 433 : Fluidics

3.00 Credit Hours

Hydraulic and pneumatic components and systems; Servocontrol valves; Fluid transmission lines; Actuators; Fluids; Power supplies and fluid motors; Compressibility and leakage; System modelling, stability and compensation.

ME 437 : Design of Fluid Machines

3.00 Credit Hours

General theory of fluid machines; Similarity considerations to fluid machines; Pumps, fans, blowers and compressors: design considerations; Cascade fluid mechanics including effects of viscosity, compressibility and three dimensional flow; Performance characteristics and limitations; Cavitation and surging.

ME 439 : Biomedical Fluid Mechanics

3.00 Credit Hours

Engineering approach to the analysis of circulatory and respiratory systems and to other problems in physiology involving fluid dynamics; Review of relevant anatomy and physiology emphasising qualitative considerations; Presentations and discussions; Simulation of physiological phenomena.

ME 441 : Theory of Structures

3.00 Credit Hours

Preliminaries; Elements stiffness matrices; Pin-joint structures; 2-D rigid-joint structures; Elastic plane element structures; Mixed elements structures; Elastic stability of 2-D rigid-joint structures; Frequency of rigid-joint structures; Finite element method.

ME 445 : Noise and Vibration

3.00 Credit Hours

Sound waves; Sound sources; Sound transmission through walls and structures; Acoustics of large and small rooms; Mechanism of sound absorption; Design of silencers.

Vibration isolation, machine foundation design; Vibration absorption; Random vibration; Beam and plate vibrations.

ME 447 : Robotics

3.00 Credit Hours

Introduction to robotics; Definitions; Plane, rotational and spatial motion with applications to manipulators; Geometric configurations: structural elements, linkages, arms and grippers; Kinematics of manipulators; Motion characteristics, trajectories, dynamics and control of manipulators; Actuators and sensors for manipulators; Application of industrial robots and programming; Teleoperators, mobile robots and automated guided vehicles. Special purpose robots.

ME 449 : Composite Materials

3.00 Credit Hours

Fibrous composites; Reinforcement types; Ply stiffness; Ply strength; Failure criteria; Layered laminate; Laminate stiffness; Laminate strength; Residual stress; Thin-walled composite sections; Interlaminar stresses; Hole in laminates; Buckling of laminates

ME 461 : Control Engineering

3.00 Credit Hours

Introduction to control systems and their representation by different equations and Laplace transforms; Block diagrams and transfer functions; Analog computer solution of system equations; System response, control action and system types; Frequency response; System analysis; System compensation; Analogues of control systems; Hydraulic and pneumatic control systems; Elements of electro-mechanical controls; Introduction to digital computer control.

ME 463 : Petroleum Engineering

3.00 Credit Hours

An overview of hydrocarbon reserves in Bangladesh; Classification of rocks and hydrocarbon deposits and their genesis; Geophysical exploration of oil and gas; Physical properties and characteristics of reservoir rocks; Origin, accumulation, composition and behaviour of hydrocarbon reserves; Analysis and prediction of reservoir performance.

Drilling rigs and their types; Rig moving equipment; Rig components and their auxiliaries; Drilling operations; Vertical and direction drilling; Well logging and interpretation; Cracking and steaming; Well completion and cementation.

ME 465 : Applied Statistics

3.00 Credit Hours

Simple regression and correlations, multiple regression. Tests of significance. Analysis of variance. Experimental design. Factor analysis. Statistical packages.

ME 467 : Automobile Engineering

3.00 Credit Hours

Introduction to road vehicles; Components of automobile; Automotive engines: types and construction; Valve events; Knock, preignition and postignition. Friction in engines and automobile components; Lubrication systems; Automotive fuel systems for SI and CI engines; Ignition system; Alternative fuels and alternative types of engines; Engine cooling and exhaust systems.

Vehicle performance: linear and angular inertia, braking effects, gyroscopic effects and reactions, tractive effort and vehicle vibration; Resistance to vehicle motion: gradient resistance, aerodynamic resistance, rolling and frictional resistance; Development strategies for minimum resistance.

Automotive transmission systems and power train: clutch, gear, differential and final drives.

Automotive safety: brakes; Reduction of injuries; Automotive body: materials and vehicle shape; Springs and suspension: Steering system.

Electrical systems: cranking motor, alternator and lighting; Electronic control systems and indicators.

Environmental considerations: vehicle emissions and control strategies; Noise pollution and control; Vehicle fuel economy.

Testing of vehicles; Motor vehicle regulations.

ME 469 : Nuclear Engineering

3.00 Credit Hours

World energy resources; Importance of fission energy; Atomic structure; Nuclear energy and nuclear forces; Nuclear fission and fusion processes; Nuclear fission reactors; Reactor controls; Reactor coolants; Process waste disposal; Nuclear power reactor systems.

ME 471 : Bio-Engineering

3.00 Credit Hours

Introduction to human musculoskeletal system; Biomechanics of human movement: applications of engineering mechanics to the movements of muscles, bones and skeletal joints; Material and structural characteristics of bones, ligaments, muscle/tendons and joints - alternative materials.

Introduction to biomechanical fluid mechanics; Engineering approach to the function of circulatory and respiratory systems involving fluid dynamics.

Introduction to biomedical instrumentation; Ultrasound, x-ray, laser, microwave and ultra-violet rays - physics and technology of generation - their use in diagnostic, therapeutic, and processing applications in medicine and industry.

ME 473 : Plastics Process Technology

3.00 Credit Hours

Introduction; Properties; Testing of properties; Identification of common plastics; Flow behaviour; Processing parameters; degradation; Fillers; Additives; Mixing and compounding; Mills: internal and continuous; Processing of plastic materials: extrusion, injection moulding, thermo-forming, blow moulding, film blowing, compression moulding, and transfer moulding; Reinforcement of plastics; Calendering and laminating; Instrumentation and control.

ME 475 : Mechatronics

3.00 Credit Hours

Introduction: Organisation structure; System concept; mechanical, electrical, electronic and software components; process; software based tools: Virtual instrumentation; CAD; CAM; Computer integrated systems; Computer interfacing; Mainpulator; Actuator types; Sensors and vision systems; Smart robots; Artificial intelligence; Factory, Office and Home automation; Future trend.

ME 481 : Textile Technology

3.00 Credit Hours

Introduction to textiles, its Industry and market; Various types of fibres: their properties and uses; Fibre to yarn: spinning processes and machinery for various fibres, quality parameters for yarns; Yarn to fabrics: weaving processes and machines, knitting, compound fabric constructions, felted and nonwoven fabric formation, decorative fabric constructions; Back processes for grey fabrics and their functional effects. Dyeing process for major types of fabrics: Printing and flocking; Fabrics quality parameters; Product packaging; Environment for different processes.

ME 370 : Industrial Training *

4 weeks (maximum)

Intensive training in a particular industry prescribed by the department of Mechanical Engineering, BUET.

Industrial Tour **

3 weeks (maximum)

Visit to prescribed industries selected by the department.

Note:

* It will be conducted after the completion of Level 2, at any convenient time as can be arranged by the Department. Results will be recorded as satisfactory after completion of the training.

** Industrial tour will be considered a co-curricular activity. It may be conducted at any convenient time as can be arranged by the Department after the completion of Level 1.

7.0 COURSES OFFERED BY ME DEPARTMENT TO STUDENTS OF OTHER DEPARTMENTS

Course No	Course Name	Level-Term/Dept.	Contact Hours	Credit Hours
ME 141	Engineering Mechanics	1-II MME.	3	3.00
		1-I Ch.E	3	3.00
ME 160	Mechanical Engineering Drawing-I	1-II MME	3	1.50
		1-I NAME	3	1.50
		1-I IPE	3	1.50
		1-II Ch.E	3	1.50
ME 165	Basic Mechanical Engineering	1-I CSE	3	3.00
ME 169	Basic Thermal Engineering	1-II NAME	3	3.00
ME 170	Basic Thermal Engineering Sessional	1-II NAME	3	1.50
ME 174	Mechanical Engineering Drawing and CAD	1-I CSE	3	1.50
		1-II Ch.E		
ME 221	Elements of Fluid Mechanics and Machinery	2-II MME	3	3.00
ME 223	Fluid Mechanics and Machinery	3-I IPE	3	3.00
ME 224	Fluid Mechanics and Machinery Sessional	3-I IPE	3	1.50
ME 243	Mechanics of Solids	2-I MME	3	3.00
		2-II IPE	3	3.00
		2-II Ch.E	3	3.00
ME 244	Mechanics of Solids Sessional	2-II IPE	3/2	0.75
ME 245	Engineering Mechanics and Theory of Machines	2-I IPE	4	4.00
ME 260	Mechanical Engineering Drawing-II	2-I MME	3	1.50
ME 261	Numerical Analysis	2-II MME	3.0	3.00
ME 265	Thermal Engineering and Heat Transfer	2-II IPE	4	4.00
ME 266	Thermal Engineering and Heat Transfer Sessional	2-II IPE	3	1.50
ME 267	Mechanical Engineering Fundamentals	2-II EEE	3	3.00
ME 268	Mechanical Engineering Fundamentals Sessional	2-II EEE	3	1.50
ME 347	Mechanical Design of Process Equipment	3 -I or 3-II Ch.E	3	3.00
ME 363	Mechanical Equipment	3 -II Arch.	2	2.00

ME 461	Control Engineering	4-I IPE	3	3.00

7.1 Prerequisite Courses for Students of Other Departments for the Courses Offered by ME Department

Course No.	Course Title	Prerequisite Course No.
ME 243	Mechanics of Solids	ME 241
ME 260	Mechanical Engineering Drawing II	ME 160

NOTE: Satisfactory class performance of any prerequisite subjects will fulfill its condition as prerequisite.

8.0 DETAIL OUTLINE OF UNDERGRADUATE COURSES OFFERED BY ME DEPARTMENT TO STUDENTS OF OTHER DEPARTMENTS

ME 141 : Engineering Mechanics

3.00 Credit Hours

Basic concepts of mechanics; Statics of particles and rigid bodies; Centroids of lines; areas and volumes; Forces in strusses and frames; Friction; Moments of inertia of areas and masses; Relative motion. Kinematics of particles- Newton's Second Law of motion; Principles of work and energy; System of particles; Kinematics of rigid bodies; Kinematics of plane motion of rigid bodies- forces and acceleration.

ME 160 : Mechanical Engineering Drawing - I

1.50 Credit Hours

Introduction; Instruments and their uses; First and Third Angle Projections; Orthographic Drawings; Isometric Views; Missing lines and views; Sectional views and conventional practices; Auxiliary views.

ME 165 : BASIC MECHANICAL ENGINEERING

3.00 Credit Hours

Sources of Energy-Conventional and Renewable; Introduction to IC Engines, Refrigeration Air-conditioning Systems.

Statics of particles and rigid bodies; Forces in trusses and frames; Relative motion, Kinematics of particles-Newton’s Second Law of motion Kinematics of rigid bodies.

Introduction to robotics; Plane, Rotational and Spatial motion with applications to manipulators, Geometric configurations: structural elements, linkages, arms and grippers; Motion characteristics.

ME 166 : Basic Mechanical Engineering Sessional

1.50 Credit Hours

Sessional based on ME 165.

ME 169 : Basic Thermal Engineering

3.00 Credit Hours

Fundamental concepts of thermodynamics, it's laws and their corollaries, non flow process and flow processes; Thermodynamic cycles and processes. Properties of pure substances, Mixture of gas and vapor.

Internal combustion engines: petrol engines, diesel engines and gas turbines with their cycles and accessories; steam generation units with accessories and mountings, steam turbines.

ME 170 : Basic Thermal Engineering Sessional

1.50 Credit Hours

Sessional based on ME 169.

ME 174 : Mechanical Engineering Drawing and CAD

1.50 Credit Hours

Introduction; Instruments and their uses; Third angle projection; Orthographic drawing; Isometric views; Sectional views; Introduction to computer graphic software: Computer aided drawing (CAD).

ME 221 : Elements of Fluid Mechanics and Machinery

3.00 Credit Hours

Fluid properties; Fluid statics: manometry, forces on submerged planes and curved surfaces; Buoyancy and floatation.

One dimensional flow of fluid; Equation of continuity; Euler's equation; Flow of fluid in pipes; Bernoulli's equation; Flow through venturimeter; Head losses.

Open channel flow; Flow through weirs, and notches; Impulse and momentum principles; Fans, and blowers; Study of centrifugal and reciprocating pumps.

ME 223 : Fluid Mechanics and Machinery

3.00 Credit Hours

Fluid properties; Fluid statics; basic hydrostatic equation, manometry, pressure variation in static incompressible and compressible fluids.

One dimensional flow of fluid: Equation of continuity; Bemoulli's equation; Fluid flow measurements; Real fluid flow; Frictional losses in pipes and fittings.

Impulse and momentum principles; Study of centrifugal and axial flow machines: turbines and pumps, blowers and compressors; Introduction to compressible flow.

ME 224: Fluid Mechanics and Machinery Sessional

1.50 Credit Hours

Sessional based on ME 223.

ME 243 : Mechanics of Solids

3.00 Credit Hours

Stress analysis: statically indeterminate axially loaded member, axially loaded member, thermal and centrifugal stresses; Stresses in thin and thick walled cylinders and spheres.

Beams : shear force and bending moment diagrams; Various types of stresses in beams; Flexure formula; Deflection of beams: integration and area moment methods; Introduction to reinforced concrete beams and slabs.

Torsion formula; Angle of twist; Modulus of rupture; Helical springs; Combined stresses: principal stress, Mohr's Circle; Columns: Euler's formula, intermediate column formulas, the Secant formula; Flexure formula of curved beams.

Introduction to experimental stress analysis techniques; Strain energy ; Failure theories.

ME 244 : Mechanics of Solids Sessional

0.75 Credit Hours

Sessional based on ME 243.

ME 245 : Engineering Mechanics and Theory of Machines

4.00 Credit Hours

Basic concepts of mechanics; Forces in trusses and frames; Friction; Centroids and moment of inertia; Kinetics of particles and rigid bodies.

Mechanisms: displacement, velocity and acceleration; Static and dynamic balancing of rotating components.

Undamped and damped free vibration of one and two degrees of freedom; Forced vibrations; Whirling of shafts and rotors, Power transmition by ropes, belts and chains; Gears and gear trains; Study of cams.

ME 260: Mechanical Engineering Drawing - II

1.50 Credit Hours

Review of orthographic projections; Fasteners, gears, keys and springs; Sectional views and conventional practices; Auxiliary views; Specifications for manufacture; Working drawings; Plan and elevation of building; Computer graphics.

ME 261: Numerical Analysis

3.00 Credit Hours

Roots of polynomials and transcendental equations; Determinants and matrices; Eigen values and eigen vectors; Solution of linear and non-linear algebraic equations; Solution of first-order differential equations.

Interpolation methods; Numerical differentiation and integration; Solving equations by finite differences; Curve fitting.

ME 265: Thermal Engineering and Heat Transfer

4.00 Credit Hours

Basic concepts and definitions; Sources of energy: conventional and renewable; Thermodynamics: fundamental concepts and laws, non-flow and flow processes; thermodynamic cycles; Introduction to: steam generating units, internal combustion engines, steam turbines, gas turbines, refrigeration and air conditioning systems.

Introduction to heat transfer; Modes of heat transfer; Study and unsteady state heat conduction and radiation heat transfer, Convection heat transfer; Natural and forced convection; Heat exchangers.

ME 266: Thermal Engineering and Heat Transfer Sessional

1.50 Credit Hours

Based on ME 265

ME 267: Mechanical Engineering Fundamentals

3.00 Credit Hours

Introduction to sources of energy.

Steam generating units with accessories and mountings; Steam turbines, condensers, vapor cycles.

Internal combustion engines: Introduction to internal combustion engines and their cycles; gas turbines.

Refrigeration and air conditioning: applications; refrigerants, different refrigeration methods.

Fluid Machinery: Fluid flow, measurements of flow, friction in flow, centrifugal pumps, fans, blowers and compressor.

Fundamental of conduction, convection and radiation: one dimensional steady state conduction in plated pipes; critical thickness of insulation.

ME 268 : Mechanical Engineering Fundamentals Sessional

1.50 Credit Hours

Sessional based on ME 267.

ME 347 : Mechanical Design of Process Equipment

3.00 Credit Hours

Vessels: classification, fundamental principles and design equations, codes and standards; Design of thin-walled cylinders and spherical shells under internal pressure; Design of thin-walled cylindrical vessels under external pressure; Design of vessels subject to combined loading; Vessel heads and supports; Bolted flanged joints; High pressure vessels; Performance tests.

Shell and tube heat exchangers: general considerations and thickness of various components.

Pipeline: wall thickness and schedule number.

ME 363 : Mechanical Equipment

2.00 Credit Hours

Review of basic concepts and definitions; Application of air conditioning; Psychrometry; Cooling load calculation; Air conditioning systems; Air handling and distribution: design of ducts; Air conditioning equipment.

Fire hazards; Fire fighting methods; Vertical transportation: types of elevators, determination of size and quantity of elevators; Incoming and outgoing traffic handling; Escalators and moving ramps.

9.0 COURSES OFFERED BY OTHER DEPARTMENTS TO ME STUDENTS

Course No	Course Name	Level / Term	Contact Hours	Credit Hours
Phy 102	Physics Sessional	1-II	3.0/2	0.75
Phy 105	Structure of Matter, Electricity and Magnetism and Modern Physics	1 - I	3.0	3.00
PHY 159	Waves and Oscillation, Geometrical Optics and Wave Mechanics	1 - II	3.0	3.00
Chem 101	Chemistry - I	1 - I	3.0	3.00
Chem 114	Quantitative Inorganic Analysis Sessional	1 - I	3.0	1.50
Chem 141	Chemistry of Engineering Materials	1 - II	3.0	3.00
Math 161	Differential Calculus, Solid Geometry and Vectors	1 - I	4.0	4.00
Math 163	Integral Calculus and Differential Equations	1- II	4.0	4.00
Math 261	Vector Calculus, Matrices and Laplace Transform	2 - I	4.0	4.00
Math 263	Complex Variable, Harmonic Analysis and Partial Differential Equations	2 - II	4.0	4.00
Hum 101	English	1 - II, 2 - 1 or 3 - II	3.0	3.00
Hum 103	Economics	1 - II, 2 - 1 or 3 - II	3.0	3.00
Hum 201	Sociology	1 - II, 2 - 1 or 3 - II	3.0	3.00
Hum 203	Government	1 - II, 2 - 1 or 3 - II	3.0	3.00
Hum 303	Principles of Accounting	1 - II, 2 - 1 or 3 - II	3.0	3.00
Hum 307	Industrial Sociology	1 - II, 2 - 1 or 3 - II	3.0	3.00
EEE 159	Fundamentals of Electrical Engineering	1 - I	3.0	3.00
EEE 160	Fundamentals of Electrical Engineering Sessional	1 - I	3.0/2	0.75
EEE 259	Electrical and Electronics Technology	2 - I	4.0	4.00
EEE 260	Electrical and Electronics Technology Sessional	2 - I	3.0	1.50
MME 291	Metallic Materials	2 - II	3.0	3.00
MME 292	Metallic Materials Sessional	2 - II	3.0/2	0.75
Shop 160	Foundry and Welding Shops	1 - I	3.0/2	0.75
Shop 170	Machine Shop Practice	1-II	3.0/2	0.75

Course No	Course Name	Level / Term	Contact Hours	Credit Hours
IPE 331	Production Processes	3 - I	4.0	4.00
IPE 332	Production Processes Sessional	3 - I	3.0/2	0.75
IPE 381	Measurement and Quality Control	3 - I	3.0	3.00
IPE 382	Measurement and Quality Control Sessional	3 - I	3.0/2	0.75
IPE 431	Machine Tools	4 - I	3.0	3.00
IPE 432	Machine Tools Sessional	4 - I	3.0/2	0.75
IPE 435	Modern Manufacturing Technology (Optional)	4 - I or 4 - II	3.0	3.00
IPE 433	Metal Cutting Processes (Optional)	4 - I or 4 - II	3.0	3.00
IPE 437	CAD/CAM (Optional)	4 - I or 4 - II	3.0	3.00
IPE 481	Industrial Management	4 - II	4.0	4.00
IPE 483	Production Planning and Control (Optional)	4 - I or 4 - II	3.0	3.00
IPE 485	Operations Research (Optional)	4 - I or 4 - II	3.0	3.00
IPE 487	Material Handling (Optional)	4 - I or 4 - II	3.0	3.00

NOTE: The courses in shaded areas have prerequisite courses.

9.1 Prerequisite Courses for ME Students for Courses Offered by Other Departments

Course No.	Course Title	Prerequisite Course No.
Hum 207	Industrial Sociology	Hum 201

NOTE: Satisfactory class performance of any prerequisite subjects will fulfill its condition as prerequisite.

10.0 DETAIL OUTLINE OF UNDERGRADUATE COURSES OFFERED BY OTHER DEPARTMENTS TO ME STUDENTS

Phy 102 : Physics Sessional

1.50 Credit Hours

Sessional based on Phy 105 and PHY 159.

Phy 105 : Structure of Matter, Electricity and Magnetism, and Modern Physics

3.00 Credit Hours

Structure of Matter: Crystalline & non crystalline solids, Single crystal and polycrystal solids, Unit cell, Crystal systems, Co-ordinations number, Crystal planes & directions, NaCl & CsCl structure, Packing factor, Miller indices, Relation between interplanar spacing from diffraction patterns; Defects in solids: Point defects, Line Defects; Bonds in solids, Interatomic distances, Calculation of cohesive & Bonding energy; Introduction to band theory: Distinction between Metal, Semiconductor and Insulator.

Electricity and Magnetism: Coulomb's law, Electric field (E), Gauss's law & its application, Electric potential (V), Capacitors and Capacitance, Capacitors with dielectrics, Dielectrics an atomic view, Charging and discharging of a capacitor, Ohms law, Kirchoff's law; Magnetic field: Magnetic induction, Magnetic force on a current carrying conductor, Torque on a current carrying loop, Hall effect, Faradys law of electromagnetic induction, Lenz's law, Self induction, Mutual induction; Magnetic properties of Matter: Hysteresis curve; Electromagnetic Oscillation: L-C Oscillations & its analogy to simple harmonic motion.

Modern Physics: Michelson-Morley's experiment, Galilean transformation, Special theory of relativity & its consequences; Quantum theory of radiation: Photo-electric effect, Compton effect, wave particle duality, Interpretation of Bohr's postulates, radioactive disintegration, Properties of nucleus, Nuclear reactions, Fission, Fusion, Chain reaction, Nuclear reactor.

PHY 159: Waves and Oscillation, Geometrical Optics and Wave Mechanics

3.00 Credit Hours

Waves & Oscillations: Differential equation of a Simple Harmonic Oscillator, Total energy and average energy, Combination of simple harmonic oscillations, Lissajous figures, Spring-mass system, Calculation of time period of torsional pendulum, Damped oscillation, Determination of damping co-efficient, forced opscilltion, Resonance, Two-body oscillations, Reduced mass, Differential equation of a progressive wave, Power &

intensity of wave motion, Stationary wave, Group velocity and Phase velocity, Architectural Acoustics, Reverberation and Sabine's formula.

Geometrical Optics: Combination of lenses: Equivalent lens and equivalent focal length, Cardinal points of a lens, Power of a lens; Defects of images: Spherical aberration, Astigmatism, Coma, Distortion, Curvature, Chromatic aberration; Optical instruments: Compound microscope, Polarising microscope, Resolving power of a microscope, Camera and photographic techniques.

Waves Mechanics: Principles of statistical physics, probabilities, Classical statistics; Quantum statistics: Bose-Einstein statistics, Fermi-Dirac statistics and their applications; Fundamental postulates of wave mechanics, Time dependent Schrodinger equation, Schrodinger equation for one-electron atom and its solution.

Chem 101 : Chemistry-I
3.00 Credit Hours

Atomic structure, quantum numbers, electronic configuration, periodic table. Properties and uses of noble gases. Different types of chemical and their properties. Molecular structure of compounds. Selective organic reactions.

Different types of solutions and their compositions. Phase rule phase diagram of monocomponent system. Properties of dilute solutions.

Thermochemistry, chemical kinetics, chemical equilibria. Ionization of water and pH concept. Electric properties of solution.

Chem 109 : Chemistry-I
3.00 Credit Hours

Modern Concepts of Atomic structure, Advanced concepts of bonds and molecular structure, Study of Crystal structures, Modern Periodic Table, Chemistry of Transition Metals, Acids and Bases, Chemistry of Solutions, Properties of Dilute Solutions, Chemical Equilibriam, Thermochemistry, Electrochemical cells, Chemical Kinetics, Phase rule and Phase diagrams, Selected topics on Organic Chemistry.

Chem 114 : Inorganic Quantitative Analysis Sessional

1.50 Credit Hours

Volumetric analysis; Acidimetry-alkalimetry, Titrations involving redox

reactions, determination of Fe, Cu and Ca volumetrically, Complexometric

titration, determination of Ca+Mg in water.

Chem 141: Chemistry of Engineering Materials
3.00 Credit Hours

Glass: Raw materials, classification, manufacturing processes and application of glasses in chemical industries.

Ceramics: Fundamental of ceramic industry; raw materials, properties, maunfacture and classification of ceramic products, Refractory materials: Raw materials, properties, manufacture and classification of refractories.

Corrosion: Nature, forms and types of corrosion, electrochemical mechanism and prevention of corrosion. Paints, varnishes and metallic coating: Composition and application of paints, varnishes and metallic coatings, methods used in applying coatings on metal surface.

Carbon: Properties and applications of carbon and graphite, manufacture and applications of non-fabricated industrial carbon.

Plastics: Fundamental characteristics, classification, raw materials and manufacture of plastics, some typical examples of plastics and their uses.

Fibres: Types of fibres, raw materials, applications and manufacturing processes of synthetic fibres.

Rubber: Sources of natural rubber, chemical treatment of latex, raw materials, synthetic reactions and properties of synthetic rubber. Lubricants: Principle of lubrication, Sources, properties and refining of lubricants; mechanical and industrial importance of lubrications.

Boiler water treatment.

Math 161: Differential Calculus, Solid Geometry and Vectors
4.00 Credit Hours

Differential calculus: Differentiation of explicit and implicit functions and parametric equations, successive differentiation of various types of functions. Leibnitz's theorem, Rolle's theorem, mean value theorem. Taylor's theorem in finite and infinite forms, Maclaurin's theorem in finite and infinite forms. Lagrange's form of remainder, Cauchy's form of remainder. Expansion of function by differentiation and integration. Partial differentiation. Euler's theorem. Tangent and normal, subtangent and subnormal in cartesian and polar coordinates. Determination of maximum and minimum values of functions points of inflexion, its applications. Evaluation of indeterminate forms by L'Hospital's rule. Curvature, radius of curvature, centre of curvature and chord of curvature. Evolute and involute. Asymptotes envelopes. Curve tracing.

Three dimensional coordinate geometry: System of coordinate, distance between two points, section formula, projections, direction cosines, equations of planes and lines.

Vectors Definition of vectors, equality of vectors, addition and multiplication of vectors, triple product and multiple products, application to

geometry and mechanism, linear dependence and independence of vectors.

Math 163 : Integral Calculus and Differential Equations

4.00 Credit Hours

Integral calculus: Definitions of integrations, integration by the method of substitution, integration by parts, standard integrals, integration by the method of successive reduction. Definite integral its properties and use in summing series. Walli's formulae. Improper integral, beta function and gamma function. Area under a plane curve in cartesian and polar coordinates, area of the region enclosed by two curves in cartesian and polar coordinates, trapezoidal rule, Simpson's rule. Arc lengths of curves in cartesian and polar coordinates, parametric and pedal equations, intrinsic equation. Volumes of solids of revolution, volume of hollow solids of revolution by shell method, area of surface of revolution.

Differential equations: Convergence and divergence of infinite series. Ordinary differential equation- formation of differential equations, solution of first order differential equations by various methods. Solutions of general linear equations of second and higher order with constant coefficients. Solutions of homogeneous line equations, applications.

Solutions of differential equations of the higher order when the dependent and independent variables are absent. Solution of differential equation by the method based on the factorization of the operators.

Math 261: Vector Calculus, Matrices and Laplace Transform

4.00 Credit Hours

Vector calculus: Differentiation and integration of vectors together with elementary applications. Line, surface and volume integrals. Gradient of a scalar functions. Divergence and curl of a vector function. Physical significance of gradient, divergence and curl. Stoke's theorem, Greeen's theorem, Gauss's theorem and their applications.

Matrices: Types of matrices and algebraic properties. Rank and elementary transformations of matrix. Solution of linear equation by matrix methods. Linear dependence and independence and independence of vectors. Quadratic forms. Matrix polynomials. Determination of characteristic roots and vectors.

Laplace transforms: Definition of Laplace transforms. Elementary transformation and properties. Convolution. Solution of differential equation by Laplace transforms. Evaluation of integrals by Laplace transforms.

Math 263: Complex Variables, Harmonic Analysis and Partial Differential Equations

4.00 Credit Hours

Complex variable: Complex number system. General functions of a complex variable Limits and continuity of a function of complex variable and related theorems. Complex differentiation and the Cauchy. Riemann equations. Mapping by elementary functions. Line integral of a complex function. Cauchy's integral formula. Kiouville's theorem. Taylor's and Laurent's theorem. Singular points. Residue. Cauchy's residue theorem. Evaluation of residues. Contour integration. Conformal mapping.

Fourier series: Real and complex form. Finite transformation. fourier integral Fourier transforms and their uses in solving boundary value problems.

Harmonic functions. definition of harmonics. Laplace's equation in cartesian, polar, cylindrical and spherical coordinates. Solutions of these equations together with applications. Gravitational potential due to a ring. Steady state temperature. Potential inside or outside of a sphere. Properties of harmonic functions.

Partial differential equation: Introduction, Equations of linear and non-linear first order Standard forms. Linear equations of higher order. Equations of the second order with variable coefficients.

Hum 101 : English

3.00 Credit Hours

English phonetics: the places and manners of articulation of the English sounds. Vocabulary. English grammar: construction of sentences, some grammatical problems. Comprehension. Paragraph writing. Precis writing. Amplification. Report writing. Commercial correspondence and tenders. Short stories written by some well known classic writers.

Hum 103 : Economics

3.00 Credit Hours

Definition of economics. Economics and engineering.

Principles of economics: Microeconomics: the theory of demand and supply and their elasticities. Price determination. Nature of an economic theory, applicability of economic theories to the problems of developing countries. Indifference curve technique. Marginal analysis. Production. production function, types of productivity. Rational region of production of an engineering firm. Concepts of market and market structure. Cost analysis and cost function. Small scale production and large scale production. Optimization. Theory of distribution.

Macroeconomics: savings, investment, employment. national income analysis. Inflation. Monetary policy. Fiscal policy and trade policy with reference to Bangladesh. Economics of development and planning.

Hum 201 : Sociology

3.00 Credit Hours

Scope of sociology: micro and macro sociology. Some fundamental concepts. Society from savagery to civilization (table). Social evolution and techniques of production: social structure of Bangladesh. Oriental and occidental societies: feudalism.

Industrial revolution: the growth of capitalism, features, social consequences. Socialism Fascism.

Social control: need, means, future of social control. Leadership: types, functions, techniques, social power.

Society and population: social determinants of fertility and mortality, human migration, demographic transition, density, the standard of living, population pyramid, population and world resources. Malthusian, optimum and socialistic population theory: Population problem of Bangladesh.

Social pathology: crime, juvenile delinquency, slum.

Nature of social change: factors of social change- biological, physical economic, cultural, technological factor. Change in production technology, means of communication, transportation, derivative social effects of converging material inventions. Effects of technology on major social institutions. Social inventions. Urbanization and industrialization in Bangladesh.

Sociology of development: process of development, social planning, Planning as a factor of social change, social change in Bangladesh- nature and trend.

Urban ecology: city, pre-industrial and industrial, growth and nature of cities in Bangladesh. Rural sociology: features of village community in Bangladesh, social mobility, urban rural contrast. Social structure of the tribal people of Bangladesh.

Hum 203 : Government

3.00 Credit Hours

Scope, some fundamental concepts of government and politics. Origin of the state. Stages of development of modern state: nation, nationalism, internationalism. Sovereignty: dejure and de-facto sovereignty. Functions of state: individualism, socialism, welfare state, fascism.

Citizenship: rights, duties, hindrances to good citizenship.

Forms of government: Aristotle's classification, modern classification, democracy, dictatorship, cabinet, presidential, unitary and federal. Organs of government and separation of powers: legislature, executive, judiciary, bureaucracy. The electorate: party system- public opinion.

Local self government.

Socio-political and economic background of the movement for Bangladesh. Government and politics in Bangladesh.

Some major administrative systems. International political organisation: the UNO and its specialised agencies.

Hum 303 : Principles of Accounting

3.00 Credit Hours

Accounting elements: the accounting equation, accounts, transactions, the double entry mechanism. Accounting procedure: the financial statements.

Cost in general: objectives and classifications. Overhead costs: allocation and apportionment.

Product costing: cost sheet under job costing, operating costing and process costing. Costing by products and joint products. marginal costing: tools and techniques, cost-volume-profit analysis.

Designing the optimal product mix. Relevant costing: analysis, profitability within the firm. Guidelines for decision making: short-run decisions.

Long-run planning and control: capital budgeting. The master budget, flexible budget and standard cost. Variance analysis.

Hum 307 : Industrial Sociology

3.00 Credit Hours

- *Prereq.: Hum 201*

Nature, scope, aim and rise of industrial sociology. History of industrialisation- ancient and modern. Early industrialisation in India: arts and crafts. Renaissance: industrial revolution in Europe. The development of industry and industrial society in Bangladesh.

The concept of work: work and art, nature of industrial work, work ideology, work values. Role of work in man's life: work and mental health, work attitudes, work involvement. The motivation to work, work satisfaction, commitment to industrial work, development and commitment of industrial labour force in Bangladesh.

The worker and the factory: the factory system, its characteristics. The formal relations of production in the factory system.

The industrial bureaucracy: the executive in the industrial bureaucracy. The role of the worker: industrial production and the worker's role, social relations at work. Management as a social elite.

Industry and community: industry and family, industry and social change, shifting values, influence of convictions, religion and industrial development. Place of industrial worker in the society.

Industry and social stratification: nature and causes of industrial conflict, role and functions of trade unionism, resolution of industrial conflict, collective bargaining.

Industrialisation and development: patterns of industrial development in developing countries-role of foreign capital and borrowed technology. Technology and social structure. Classification of industries: role of cottage industries, labour intensive vs. heavy industries. Modernisation.

EEE 159 : Fundamentals of Electrical Engineering

3.00 Credit Hours

Laws of electric circuit: Ohm's law, Kirchhoffs voltage and current laws, delta-wye transformation. Electrical networks: network analysis-methods of branch and loop currents, method of node-pair voltages, Thevenin's and Norton's theorems. magnetic concepts and units: magnetic field, right-hand rule, magnetic flux density, Biot-Savart law, magnetic field intensity, measurement of magnetic flux, energy of magnetic field. Characteristics of ferromagnetic materials theory of ferromagnetism. B.H. curves, hysteresis loss, eddy currents and eddy-current loss, total core loss. Introduction to magnetic circuit. Electromagnetic forces: forces upon a current-carrying conductor and charged particle moving in a magnetic field. Electromagnetic

torque: electric motor. Electromagnetic induction and emf: Lenz's law, Blv rule, elementary a.c. generator.

General concepts and definitions. Instantaneous current and power, R-,L-, C-, RL- and RLC- branches. Effective current and voltage: average values, form factor, crest factor, power real and reactive. Introduction to vector algebra. Impedances in polar and cartesian forms. Sinusoidal single phase circuit analysis. Impedance in series, parallel branches, series-parallel circuits. Network analysis- Thevenin's theorem. Balanced polyphase circuits: three-phase, four wire system of generated emfs, three-phase, three-wire systems, balanced wye loads, balanced delta loads, power in balanced systems, power factor.

EEE 160 : Fundamentals of Electrical Engineering Sessional

0.75 Credit Hours

Laboratory experiments based on EEE 159.

EEE 259 : Electrical and Electronics Technology

4.00 Credit Hours

Balanced three-phase circuit analysis and power measurement. Single phase transformer-equivalent circuit and laboratory testing, introduction to three-phase transformer. DC generator: principle, types, performances and characteristics. DC motor: principles, types of motor, performances, speed control, starters and characteristics. A.C. machines: three phase induction motor principles, equivalent circuit. Introduction to synchronous machines and fractional horse power motors.

Semiconductor diode, transistor characteristics, equivalent circuits, self-biasing circuits, emitter-follower amplifiers, push-pull amplifier. Introduction to silicon controlled rectifier and its application. Oscilloscope. Transducers: strain, temperature, pressure, speed and torque measurements.

EEE 260 : Electrical and Electronics Technology Sessional

1.50 Credit Hours

Laboratory experiments based on EEE 259.

MME 291 : Metallic Materials

3.00 Credit Hours

Concept of malleability, ductility, toughness, fatigue resistance and other properties Mechanical and non-destructive tests of metals. Pig iron: production and uses. Cast iron: production, types, uses and effects of impurities. Steels: Bessemer and open-hearth steels, production and uses. Plain carbon and different types of allow steels. Bearing metals, light allows, common metals and their alloys. The Fe-FeC equilibrium diagram. Types of heat treatment. Case carburizing and nitriding.

MME 292 : Metallic Materials Sessional

0.75 Credit Hours

Experiments based on Met. E. 225.

Shop 160 : Foundry and Welding Shops

0.75 Credit Hours

Foundry: Introduction to foundry, tools and equipment. Patterns: function, pattern making. Molding: molding materials sand preparation, types of mold, procedure. Cores: types, core making materials. Metal melting and casting. Inspection of casting and casting defects.

Welding: Metal joints: rivetting, grooving, soldering, welding. Welding practice: electric arc steel, aluminium. types of electrode. Welding defects: visual, destructive and non-destructive tests of welding.

Gas welding and equipment, types of flame, welding of different types of materials. Gas welding defects. Test of gas welding.

Shop 170 : Machine Shop Practice

0.75 Credit Hours

Tools: common bench and hand tools, marking and layout tools, measuring tools, cutting tools, machine tools. Bench work on jobs. Practices on machine tools: drilling machine, lathe machine, shaper machine, milling machine, grinding machine.

IPE 331 : Production Process

4.00 Credit Hours

Selection of machining.

Casting: sand, die, centrifugal and other types of casting, Casting design and casting defects Chipless metal forming process: different types of hot and cold working processes. Welding arc, gas, TIG, MIG, resistance, thermit, and special types, Brazing and soldering.

Tool geometry and chip formation processes.

Metal removing processes: turning, drilling, shaping, planing, milling, broaching, grinding, precision and non-precision finishing processes.

Plastic, ceramic and glass product manufacturing processes.

IPE 332 : Production Process Sessional

0.75 Credit Hours

Experiments based on IPE 331.

IPE 381 : Measurement and Quality Control

3.00 Credit Hours

Organization of inspection kinds of inspection. Standards of length. Scope and techniques for maintaining tolerances, grades of manufacturing accuracy. Assembly-selective and interchangeable assembly, gauging and limit gauges. Taylor's principles on limit gauges, thread measurement and thread gauges. Abbey's principle, measuring tools for angles and tapers, instruments for checking straightness and flatness and for alignment test. Gear measurement, measurement of surface finish, surface roughness. Electrical and electronic measurements. Nondestructive test.

Frequency distribution, measures of central tendency and dispersion. Concept of probability, conditional probability and Bayes' theorem. Probability distributions, moment and moment generating function. Sampling theory, estimation hypothesis testing. Acceptance sampling plans-single, double, sequential, rectifying inspection plans, Control charts. X, R and C charts. Regression analysis, analysis of variance. Concept of quality circle. TQM and TQC.

IPE 382 : Measurement and Quality Control Sessional

0.75 Credit Hours

Experiments based on IPE 381.

IPE 431 : Machine Tools

3.00 Credit Hours

Mechanical, electrical hydraulic and pneumatic drives in machine tools. Bearings, slide ways, structure and control of machine tools. Detailed case study of engine lathe, turret lathe, milling machine, grinding machine, and gear shaping machine.

Installation and acceptance tests of machine tools.

Locating principles and locators, clamps, dies, jigs/fixtures.

IPE 432 : Machine Tools Sessional

0.75 Credit Hours

Experiments based on IPE 431.

IPE 433 : Metal Cutting Process

3.00 Credit Hours

Theory of metal cutting: mechanism of chip formation, chip breaker, chip-tool contact process, types of chip.

Tool materials, tool design and manufacturing.

Theoretical and experimental determination of cutting forces, heat phenomenon, cutting fluid, tools wear and tool life, economics of metal cutting.

Gear and thread manufacturing processes.

IPE 435 : Modern Manufacturing Technology

3.00 Credit Hours

Introduction to modern manufacturing technology.

Modern manufacturing processes: electro-discharge machining (EDM), electro-chemical machining (ECM), electron-beam machining (EBM), LASER-beam machining (LBM), ultrasonic machining (USM), plasma arc machining (PAM), abrasive jet machining (AJM) and related machines.

Protective coatings and hard facing. Modern welding processes.

Automatic and semi-automatic machine tools and automatic transfer lines.

Introduction to NC, CNC and DNC.

IPE 437 : CAD/CAM

3.00 Credit Hours

CAD: fundamental concepts, application, benefits, hardware and software, types of CAD systems, common 2D CAD software features, basic 3D CAD features.

CAM: fundamental concepts, trend of development of numerical control (NC), principles of NC, types of NC systems, types of NC machines, CNC (manual) part programming, CNC part programming using CAM softwares, interfacing CAM software with CNC machines, computer aided machining.

IPE 481 : Industrial Management

4.00 Credit Hours

Organization and management: evolution, management functions, organisation structure, development of organization theory, study of various types of organization and management information systems, concepts and scope of application.

Cost management elements of cost of products, cost centres and allocation of overhead costs. Management accounting: marginal costing, standard costing, cost planning and control, budget and budgetary control, development and planning process, annual development plan, national budget.

Financial management: objectives, strategy, financing, performance analysis of enterprises, investment appraisal, criteria of investment.

Personnel management: importance, scope, need hierarchy, motivation, defense mechanism, productivity and satisfaction, leadership, group dynamics, job evaluation and merit rating personnel development-hiring, training, wage systems.

Marketing management: marketing concept, marketing organization, industrial and consumer selling, channel decisions, advertising decisions, new product strategy.

Technology management.

Case study.

IPE 483 : Production Planning Control

3.00 Credit Hours

Elements of production planning and control, types of production system.

Forecasting methods and their application, aggregate planning, master production scheduling, MRP, coding and standardization, capacity planning, inventory management, ABC analysis. Production scheduling

techniques, CPM and PERT, line balancing capacity planning. Plant location and layout, work study and method study, plant performance measurement Introduction to product development and design.

Computers in production planning and control and MRPII, JIT.

IPE 485 : Operations Research

3.00 Credit Hours

Introduction, linear programming (simplex and transportation model), Network analysis dynamic programming, introduction to simple queuing models, introduction to probabilistic inventory models, game and decision theory, simulation integer programming, scheduling, and reliability.

IPE 487 : Material Handling

3.00 Credit Hours

Material handling importance and scope of material handling. Classification of materials, unit load and bulk loads. Analysis of material handling problems, system concept, selection and classification of conveying equipment. Efficiency of material handling systems, general theory of conveyors. Computer control material handling (AGV, ASRS etc.). Description and design of belt, chain, flight, screw, pneumatic and hydraulic conveyors, operation, and selection of industrial truck loads.

Packaging: packaging materials, layout for packaging.

Testing procedure of packages: vibration test, drop test, performance limit, testing machines.

Storage and warehousing sorting, automated warehousing.