EAST WEST UNIVERSITY

excellence in education

Undergraduate Catalog 2005

An institution that promotes eastern culture and values, and meaningfully blends eastern and western thought and innovation

Undergraduate
Catalog 2005

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East West University

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University Profile

Mission Statement

In keeping with its name, East West University, rated among the top private universities of Bangladesh, is an institution that promotes eastern culture and values, and meaningfully blends eastern and western thought and innovation. As an institution of higher learning that promotes and inculcates ethical standards, values and norms, East West University (EWU) is committed to the ideals of equal opportunity, transparency, and non-discrimination.

The primary mission of EWU is to provide, at a reasonable cost, post-secondary education characterized by academic excellence in a range of subjects that are particularly relevant to current and anticipated societal needs. Central to the university's mission is its intention to provide students with opportunities, resources and expertise to achieve academic, personal and career goals within a stimulating and supportive environment. EWU is striving not only to maintain high quality in both instruction and research, it is also rendering community service through dissemination of information, organization of training programs and other activities. Sensitive to the needs of its students and staff, EWU is committed to providing a humane, responsive and invigorating atmosphere for productive learning and innovative thinking.

History

The idea of establishing a private university to provide quality education at an affordable cost in Bangladesh was first mooted by a group of prominent academics, business leaders, professionals and education enthusiasts led by Dr. Mohammed Farashuddin. With this end in view, this group formed a non-profit, non-political, charitable organization called Progoti Foundation for Education and Development (PFED). East West University is its first major project. Members of the Board of Directors of East West University are: Mr. Jalaluddin Ahmed, Mr. S.M. Nousher Ali, Mr. Farooque B. Chaudhury, Dr. Rafiqul Huda Chaudhury, Mr. Syed Manzur Elahi, Dr. Mohammed Farashuddin, Mr. Mohammed Zahidul Haque R.Ph., Dr. Saidur Rahman Lasker, Dr. Muhammad A. Mannan, Professor M. Mosleh-Uddin, Mr. Shelley A. Mubdi, Mr. M.A. Mumin, Dr. Khalil Rahman, Mr. H.N. Ashequr Rahman and Mrs. Razia Samad.

After being accorded permission by the Government under the Private University Act (Act 34) of 1992, East West University was launched in 1996. Classes started in September, 1996 with 6 faculty members and 20 students in the present campus located at 45, Mohakhali Commercial Area, Dhaka.

Dr. Mohammed Farashuddin, Syed Manzur Elahi and
H.N. Ashequr Rahman with former President Shahabuddin Ahmed

Accreditation and Collaboration

East West University has been accredited by the Government of the People's Republic of Bangladesh, and its curricula as well as programs have been approved by the Bangladesh University Grants Commission. The President of the People's Republic of Bangladesh is the Chancellor of EWU. The Vice Chancellor, the Pro-Vice Chancellor, and the Treasurer are appointees of the President of the country in his capacity as the Chancellor of the University.

East West University has formal collaboration agreements with these leading universities in the USA:

> Pace University (New York)
> Suffolk University (Boston)
> Southern Illinois University at Carbondale
> University of Luton, Bedfordshire, England
> University of Fukui, (UF) Japan

It has also entered into collaboration agreements with a number of other well-known universities in the USA, UK and Australia.

Location

The temporary campus of the university is located at 41, 43,45,46 and 49 Mohakhali C/A, Dhaka. It consists of 3 (three) twelve-storied and 2 (two) six-storied buildings with approximately 1,30,000 (one lakh and thirty thousand) sft of space. The campus is situated in the heart of the city and can be easily accessed by all modes of public transportation.

With a view to shifting to its own campus, EWU has purchased 555.75 decimals of land at Mouja Vadham, P.S. Tongi, District Gazipur. It has also received allotment of 1 (one) bigha of land in Uttara from RAJUK. Most recently the university has purchased a total of 7.4 bigha land at Aftabnagar, on the Progoti Sarani adjacent to BTV. The stipulation is to commence construction of the first EWU Campus in Aftabnagar in early 2006. East West University intends to move to its own campus by the end of 2007.

Degrees Offered

Currently, EWU offers the following four-year Bachelor degrees:

- B.B.A. (Majors in Accounting, Marketing, Finance, Management, International Business, HRM and MIS)
- B.Sc. in Computer Science
- B.Sc. in Computer Science and Engineering
- B.Sc. in Electrical and Electronic Engineering
- B.Sc. in Information and Communications Engineering
- B.A. in English
- B.S.S. in Economics
- Bachelor of Pharmacy
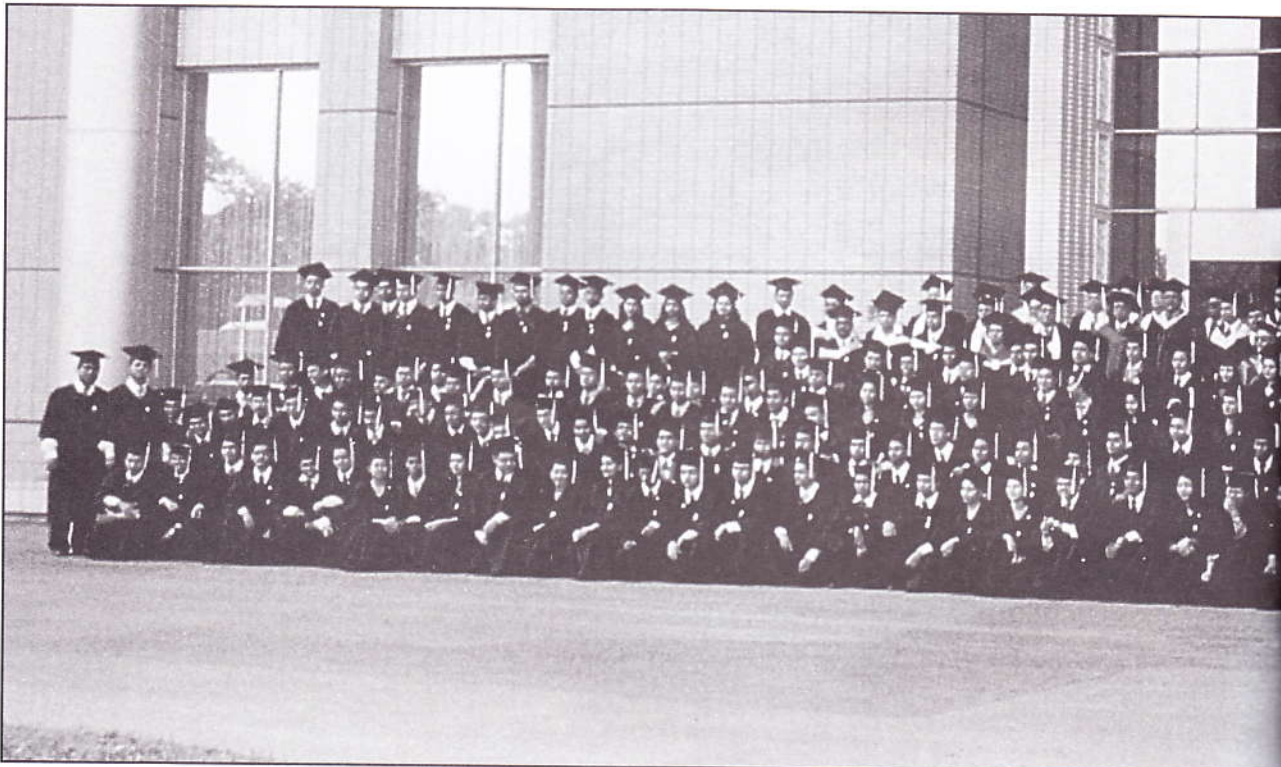
EWU plans to offer the following Bachelor's Degrees in the near future

- Nursing
- Law
- Journalism
- Health Management
- Management Information System (MIS)
- Population Sciences
- Applied Physics and Electronics
- Biomedical Engineering

EWU also offers the following Graduate Degrees

MBA Regular and Executive

Master of Arts in English (MA in English)

Master of Computer Applications (MCA)

Master of Science in Computer Science and Engineering (MS in CSE)

Master of Bank Management (MBM)

Master of Law and Legislature (LLM)

English is the medium of instruction and examination for all programs offered by EWU.

Non-Discrimination

East West University believes that every type of discrimination, whether social or cultural, whether based on race, gender, color, social condition, language or religion, is to be overcome and eradicated.

Disclaimer

The content of this catalog is subject to change without notice. Every student accepted for registration in the University shall be deemed to have agreed to such deletions, revisions or addition whether made before or after his/her acceptance.

East West University does not accept any responsibility for loss or damage suffered or incurred by any student as a result of suspension or termination of services owing to strikes, lockouts, riots, weather, or any other cause beyond reasonable control of the University.

Semesters: (EWU has 3 semesters in an academic year)

Spring : January - April (Third Saturday of January)
Summer : May- August (Third Saturday of May)
Fall : September- December
(Third Saturday of September)

Class Meetings

Classes are held from Saturday through Wednesday. Each undergraduate course consists of one hour and thirty minutes classes meets twice a week i.e. a total of three hours per week. In EWU, for 1 (one) credit theory, 1 (one) hour of classes per week and for 1 (one) credit lab, 2 (two) hours of classes per week is followed.

Slot	Week Day
ST	Sunday, Tuesday
AW	Saturday, Wednesday
AM	Saturday, Monday
MW	Monday, Wednesday

If classes cannot be held as per schedule due to unavoidable reasons, makeup classes are arranged.
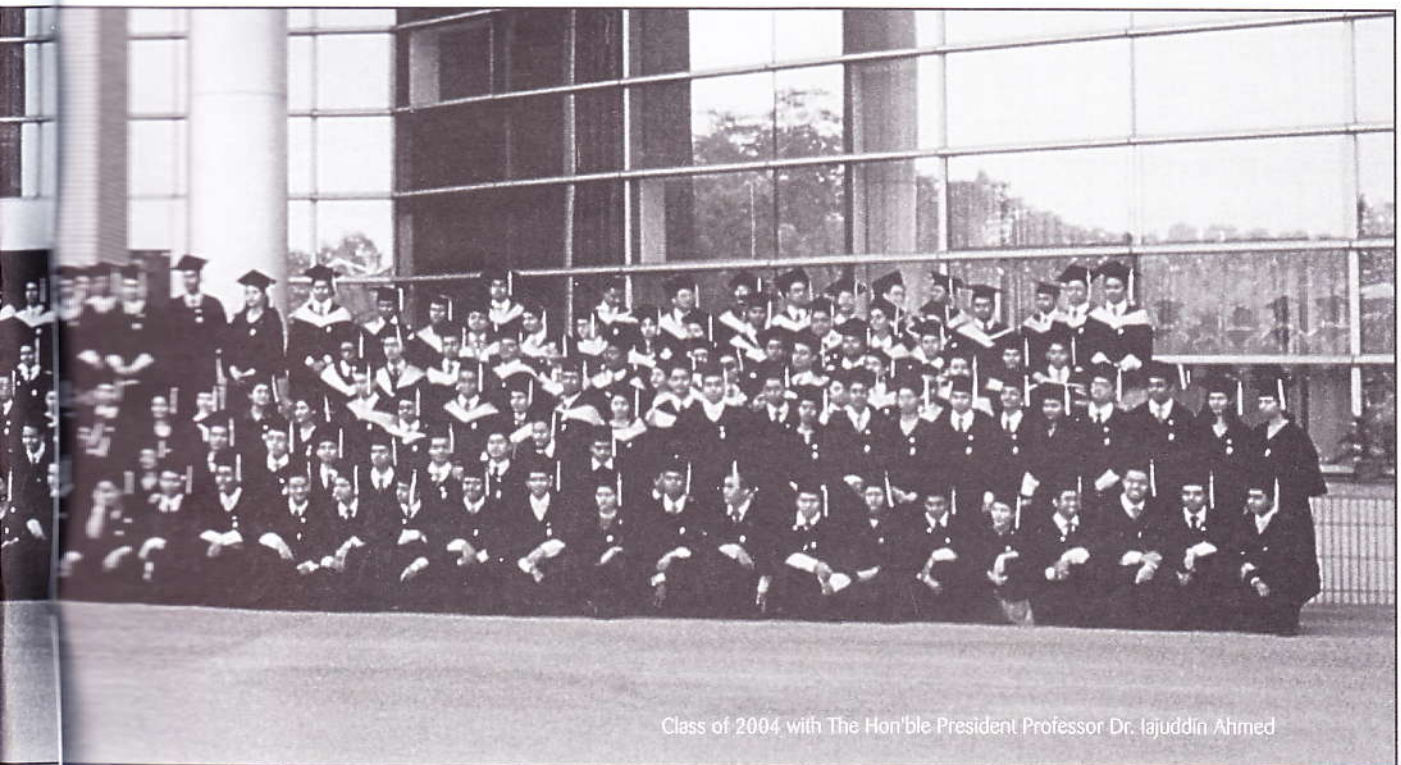
Class of 2004 with The Hon'ble President Professor Dr. Iajuddin Ahmed

Administration

President	Mohammed Farashuddin, Ph.D.
Treasurer	Syed Manzur Elahi, M.A. (Economics)
Pro-Vice Chancellor (Acting Vice Chancellor)	Professor Mohammad Musa, Ph.D.
Advisor	Professor Nurul Islam
Dean of the Faculty of Business and Economics	Professor Abdul Mannan, M.B.A
Dean of the Faculty of Liberal Arts and Social Sciences	Professor Fakrul Alam, Ph.D.
Dean of the Faculty of Sciences and Engineering	Professor Md. Mozammel Huq Azad Khan, Ph.D.
Registrar	Firdaus Ali, M.A. (Economics)
Joint Registrar	Suraiya Ahmad, M.S. (Education)
Deputy Registrars	Sk. Ruhul Amin, B.Com.
	Mashfiqur Rahman, M.Com
Assistant Registrars	Shafik Waes, MSS
	Farzana Aziz, MBA
	Mohammad Mosharrof Hussain Mridha, MBA
Controller of Finance & Accounts	Amal Krishna Das, M. Com. A.C.A.
Joint Librarian	Md. Nazim Uddin, M.A
Systems Manager	Md. Mahabub Alam, BSc. Engineering (EEE)
Head, Career Counseling Center	SI Nusrat A Chaudhury, MBA
Proctor	Kazi Khaled Shams Chisty, MBA

Chairpersons of Departments

Business Administration	Professor Md. Saleh Uddin, Ph.D.
Computer Science & Engineering	Syed Akhter Hossain, M.Sc.
Economics	Mohammed Farashuddin, Ph.D.
English	Professor Fakrul Alam , Ph.D.
Electrical and Electronic Engineering	Professor Md. Mozammel Huq Azad Khan, Ph.D.
Applied Physics & Communications Engineering	Professor Mohamed Ruhul Amin, Ph.D.
Pharmacy	Professor Bidyut Kanti Datta, Ph.D.
Social Sciences	Professor Nasreen Wadud, Ph.D.

EWU Academic Departments

Faculty of Business and Economics

Department of Business Administration
    Undergraduate Studies
    Bachelor of Business Administration (BBA) - 123 Credits
    Graduate Studies
    Master of Business Administration (MBA) - 60 Credits
    Master of Business Administration, Executive Program (EMBA) - 42 Credits

Department of Economics
    Undergraduate Studies
    Bachelor in Social Science (Economics) - 123 Credits
    Graduate Studies
    Master of Bank Management - 60 credits
    Master of Development Studies - 36 credits (under advanced stage of approval)
    Master of Economics and Law - 50 credits (under preparation)
    Master of Public Policy - 30 credits (under preparation)
    Master of Economics - 30 credits (under preparation)

Faculty of Liberal Arts and Social Sciences

Department of English
    Undergraduate Studies
    BA in English - 123 credits
    Graduate Studies
    MA in English - 36 credits/ 45 credits

Department of Law
    Graduate Studies
    Master in Law and Legislature (LLM) - 24/30 credits

Department of Social Sciences

Faculty of Sciences and Engineering

Department of Computer Science & Engineering
    Undergraduate Studies
    BSc. in Computer Science (CSC) - 130 credits
    BSc. in Computer Science & Engineering (CSE) - 143 credits
    Graduate Studies
    Master of Computer Applications (MCA) - 60 credits
    Master of Science in Computer Science and Engineering (MS in CSE) - 33 credits

Department of Electrical and Electronic Engineering
    Undergraduate Studies
    BSc. in Electrical and Electronic Engineering (EEE) 146 - 151 credits

Department of Pharmacy
    Undergraduate Studies
    Bachelor of Pharmacy (B. Pharm) - 148 credits

Department of Applied Physics & Communications Engineering
    BSc. in Information and Communications Engineering (ICE) - 140 credits

Graduation Requirements

Graduation Requirements for Undergraduate Programs

Meeting the graduation requirements is the student's responsibility. The requirements include:

1. Depanding on the program a minimum of 123-151 credits for a bachelor's degree, of which at least half must be earned at EWU in a degree program (residency requirement). Candidates for BA in English, BBA, and BSS in Economics degrees will be required to complete no less than 123 credits; B.Sc. degree candidates majoring in Computer Science 130 credits; Computer Science and Engineering 143 credits; those majoring in Bachelor of Pharmacy 148 credits; Electrical and Electronic Engineering 146 credits and those majoring in Information and Communications Engineering 140 credits. Total credit requirements for graduation may change.

2. Completion of all course requirements for the degree/major.

3. A minimum CGPA of 2 will be required for graduation. The CGPA will be calculated on the basis of grades earned in the courses.

4. On completion of all requirements, students must apply to the Registrar stating their intentions that they want to be considered for the award of the Bachelor degree in the relevant discipline. A Graduation Fee is mandatory for every graduating applicant and is due at the time of submitting the application.

5. Payment of all university dues.

6. All university properties must have been returned.

Fulfillment of the above conditions does not necessarily mean that a degree will be conferred on the student. The university reserves the right to refuse the awarding of a degree on disciplinary or similar grounds.

Minor Requirements

Undergraduate students are allowed to do one/more minor. The minor must be from departments other than his/her own. Students doing minor must complete a minimum of seven courses of which at least four courses must be clean. Students intending to do a minor must apply in writing to the respective Dean of Faculty for permission after completing 50% of courses with a minimum CGPA of 2.50 for his/her base degree. Students must have a minimum CGPA of 2.00 to qualify for a minor.

Departmental requirements are given as under:

Business Administration
Compulsory Courses: ACT 101, FIN 101, MGT 101 MKT 101. Optional Courses: (Any Three) ACT 201 BUS 231, BUS 361, FIN 201, MGT 251, MGT 337 MKT 201, ECO 328

Economics
ECO 101, ECO 102, MAT 110, ECO 301, ECO 302 plus any two 300/400 level economics courses.

English
Core Courses: ENG 145/ENG 191, ENG 309, ENG 310
Elective Courses: ENG 226, ENG 313, ENG 430, ENG 435

Information and Communications Engineering
Group A (Any Five Courses)
ICE 211, ICE 302, ICE 303, ICE 310, ICE 312, ICE 314 ICE 320, ICE 412

Group B (Any Two Courses)
ICE 414, ICE 415, ICE 423, ICE 435

Computer Science and Engineering
Group A (Any Five Courses)
CSE 105, CSE 107, CSE 207, CSE 245, CSE 301 CSE 412, EEE 109, EEE 204, EEE 251, EEE 255

Group B (Any Two Courses)
CSE 410, CSE 432, CSE 442, CSE 480

Electrical and Electronic Engineering
Group A (Any Five Courses)
EEE 101, EEE 102, EEE 201, EEE 301, EEE 302 EEE 303, EEE 306, EEE 307, EEE 308

Group B (Any Two Courses)
EEE 401, EEE 403, EEE 416, EEE 423, EEE 445

Department of Business Administration

The Department of Business Administration at East West University started its operation in September 1996. Since its inception it has been offering undergraduate program in Business Administration. The contemporary and innovative curriculum of BBA degree is based upon a compelling philosophy of teaching that allows students to cope with the radical transformation that business activities have been undergoing in the wake of globalization. It covers the recent development in business as well as the areas that have traditionally formed the core of the business discipline.

Program Mission

The primary mission of the BBA program of EWU is to enhance the capabilities of students and to train them as efficient and effective leaders in diverse areas of business. It intends to provide students with an integrated and practical knowledge to understanding and managing current and anticipated business practices in a socially responsible manner.

Program Objective

The BBA program at EWU is so designed as to provide the students with opportunities and expertise to achieve a successful career goal. More specifically, a graduate of Business Administration is expected to attain a high level of skill to be able to:

- Monitor local and global business, geopolitics and economic environment.

- View the market structure as a whole.

- Analyze marketing management problem.

- Use correct devices to solve any problems related to marketing management issues.

- Enhance critical thinking and develop interpersonal communication and leadership skills.

- Understand legal environment of business.

- Plan and manage human resources for the survival and growth of organization.

- Install and analyze MIS system within an organizational setting.

- Understand investment and portfolio management, management of financial institutions, corporate finance, international financial management, insurance and risk management and derivative securities.

- Apply accounting principles, install and operate accounting system, have knowledge about legal framework of accounting for different types of organization, handle cost and management accounting techniques.

- Learn to develop sustainable competitive advantage.

Present Status and Future Direction

At present the BBA program at EWU offers concentration in six areas: Accounting, International Business, Management Information System, Finance, Marketing, Management, and Human Resources Management. To qualify for the BBA degree at EWU one has to complete a minimum of 41 courses (123 credits) that normally takes four and half years. Students may complete the degree earlier by enrolling in more than three courses each semester.

Of the 41 courses that a student must complete for the degree, 11 are General Education Courses, 20 are Core Courses, three are Open Elective Courses and the rest are Concentration Courses. Students may be allowed to do concentration in two areas. Students already graduated may also be allowed to do relevant courses for concentration for which a separate certificate will be issued by the Department Chair. Students are also required to do Internship/Project that helps expose them to practical world of corporate business. The course curriculum is continuously updated to suit the needs of the market. We continuously keep in touch with the corporate world through a number of programs. Notable among these are "Know the Success Story: Meet the Personality Behind Success" program where renowned business leaders of the country are invited to speak before our students. Seminars are organized regularly where company executives are invited as guest speakers.

Total number of students currently enrolled in the BBA program is 2528. The number of applicants seeking admission into the BBA program of EWU has been increasing at a very high rate. The acceptance rate in the last two semesters was about 25 percent only. One reason is the deliberate policy of the university to keep the number of students at or around its present level. We are putting more emphasis on quality than on quantity. So far a total of 610 students graduated from this

department. A sizeable number of them are now working with reputation in very prestigious organizations like British American Tobacco Co Ltd., Unilever (Bd.) Ltd., Standard Chartered Bank, Grameen Phone Ltd., ADCOM, Banglalink etc.

The main strength of the BBA program at EWU lies in its highly skilled and dedicated faculty members. We have the highest number of full-time faculty members among all private universities of the country. At present 14 out of our 50 faculty members are Ph. Ds from reputed universities. We have been continuously striving to maintain a reasonably high teacher-student ratio.

The courses that are offered for BBA students are shown in the following pages.
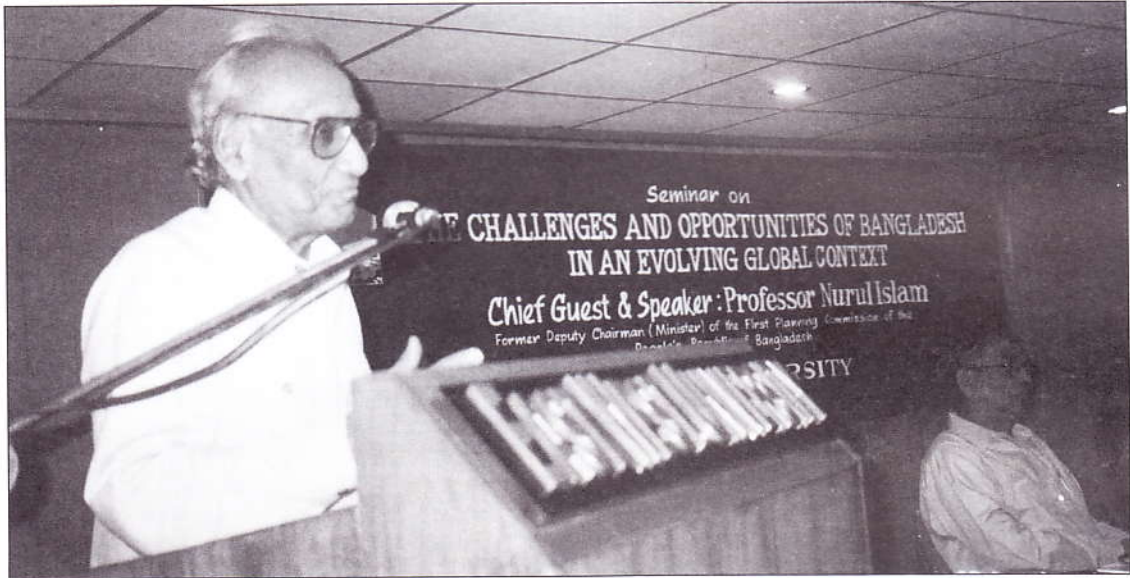
Professor Nurul Islam addressing a Seminar at EWU

A Round Table Discussion

Bachelor of Business Administration (BBA)

Minimum Requirement 123 Credits

Course	Title	Credit
General Requirements		33

Compulsory General Education Courses		24
BUS 101	Introduction to Business	3
CSE 101	Introduction to Computers I	3
ENG 100	Spoken English	3
ENG 101	Basic English	3
ENG 102	Composition and Communication Skills	3
GEN 201	Bangladesh Studies	3
MAT 110	Mathematics for Business and Economics I	3
STA 101	Introduction to Statistics	3

Optional General Education Courses		9
Choose three courses from		
CSE 102	Introduction to Computers II	3
GEN 202	Eastern Culture and Heritage	3
GEN 203	Ecological System and Environment	
GEN 204	Western Thought	3
GEN 205	Introduction to Psychology	3
GEN 206	Introduction to Sociology	3
GEN 207	Industrial Psychology	3
GEN 208	Introduction to Philosophy	3
GEN 209	Social Psychology	3
GEN 210	International Relation	3
GEN 211	Concepts of Journalism & Media Studies	3
GEN 212	Women in Development	3
MAT 100	College Mathematics (compulsory for those students who have no mathematics in HSC or equivalent level)	3

Core Requirements		60
ACT 101	Financial Accounting	3
ACT 201	Management Accounting II	3
BUS 231	Business Communication	3
BUS 361	Legal Environment of Business	3
ECO 101	Principles of Microeconomics	3
ECO 102	Introduction to Macroeconomics	3
FIN 101	Principles of Finance	3
FIN 201	Business Finance	3
HRM 301	Human Resources Management	3
ITB 301	International Business	3
MAT 211	Mathematics for Business and Economics II	3
MGT 101	Principles of Management	3
MGT 251	Organizational Behavior	3
MGT 337	Production Operations Management	3
MGT 480	Strategic Management	3
MIS 101	Introduction to Management Information System	3
MIS 305	Enterprise Information System	3
MKT 101	Principles of Marketing	3
MKT 201	Marketing Management	3
STA 217	Statistics For Business And Economics	3

Course	Title	Credit
Concentration Requirements		18
Students may be allowed to do concentration in two areas		

a) Concentration in Accounting		
ACT 311	Taxation	3
ACT 411	Intermediate Accounting-I	3
ACT 421	Intermediate Accounting-II	3
ACT 441	Cost Accounting	3

Choose two courses from		
ACT 427	Auditing	3
ACT 430	Accounting Information System	3
ACT 456	Accounting Theory	3
ACT 478	Advanced Accounting	3

b) Concentration in Finance		
FIN 425	Investment Analysis and Management	3
FIN 435	Managerial Finance	3
FIN 465	International Financial Management	3

Choose three courses from		
ACT 311	Taxation	3
FIN 335	Financial Institutions and Markets	3
FIN 350	Real Estate Finance	3
FIN 380	Management of Commercial Bank	3
FIN 408	Financial Analysis and Control	3
FIN 410	Risk Management and Insurance	3
FIN 450	Cases in Financial Management	3
FIN 475	Option and Future	3

c) Concentration in International Business		
ITB 401	International Operations	3
ECO 328	International Trade and Finance	3
ITB 465	International Finance Management	3

Choose three courses from		
ITB 445	International Financial Institution	3
ITB 450	International Business Negotiations	3
ITB 455	Country Risk Analysis	3
ITB 460	International Competitiveness	3
MKT 408	International Marketing	3
MKT 411	Export-Import Management	3

d) Concentration in Management		
MGT 402	Management Science	3
MGT 421	Entrepreneurship Development	3
MGT 465	Leadership Management	3

Choose three courses from		
MGT 405	Organizational Development and Change	3
MGT 410	International Labor Management	3
MGT 425	Total Quality Management	3

MGT 437	Small Business Management	3
MGT 448	Managing Globalization	3

e) Concentration in Management Information System

MIS 401	Structured Programming	3
MIS 402	System Analysis and Design	3
MIS 404	Networking and Operating System	3
MIS 406	Relation Database Management System	3

Choose two courses from

MIS 403	Object Oriented Programming	3
MIS 407	System Integration & Security and Internet	3
MIS 408	Internetworking with TCP/IP & Imple. Exc. Serv.	3
MIS 409	Client/Server Administration	3
MIS 410	Database Systems	3
MIS 415	Decision Support System	3
MIS 419	E-Commerce and Web Programming	3

f) Concentration in Marketing

MKT 410	Consumer Behavior	3
MKT 414	Marketing Research	3

Choose four courses from

MKT 401	Sales Management	3
MKT 405	Promotion Management	3
MKT 408	International Marketing	3
MKT 411	Export-Import Management	3
MKT 412	Service Marketing	3
MKT 416	Brand Management	3
MKT 418	Physical Distribution	3
MKT 430	Strategic Marketing	3

g) Concentration in Human Resource Management

HRM 411	Human Rresource Planning	3
HRM 412	Compensation Management	3
HRM 414	Industrial Relations	3

Choose three courses from

HRM 415	Training and Development	3
HRM 416	Strategic Human Resource Management	3
HRM 417	Human Resource Information System	3

HRM 418	Job Analysis and Performance Appraisal	3
HRM 419	Leadership, Power and Influence	3
HRM 420	Organization Development	3
Open Electives		**9**

Students must take three 300/400 level courses as open electives to quality for the BBA degree. Students can choose any 300/400 level course from BA, and/or CSE, and/or CIT, and/or ENG department. Students will not be allowed to take the following two courses as open elective course: CIT 301 (Network Technology) and CIT 403 (Local Area Network). Students must complete relevant prerequisite courses to qualify for enrollment into these open elective courses. Students willing to enroll into open elective courses of other departments must consult with the chairpersons and course instructors concerned.

Internship/Project Work		**3**
Choose one course from		
BUS 498	Project Work	3
BUS 499	Internship	3

Credit requirements for a second major in Marketing, Finance, Accounting & Management

Credit Hour Requirement for a second major in BBA for non-BBA students   51

Required core coureses		33
MAT 110	Mathematics for Business and Economics I	3
STA 101	Introduction to Statistics	3
ECO 101	Principles of Microeconomics	3
ECO 102	Introduction to Macroeconomics	3
MAT 211	Mathematics for Business and Economics II	3
STA 217	Statistics for Business and Economics	3
ACT 101	Financial Accounting	3
FIN 101	Principles of Finance	3
MGT 101	Principles of Management	3
MKT 101	Principles of Marketing	3
BUS 231	Business Communication	3
ANY ONE ACT 201/FIN 201/MKT 201/MGT 251		**3**
Major Courses ACT/FIN/IB/MKT/MGT/MIS		**15**

Same as BBA students, 5 courses from the concentration area
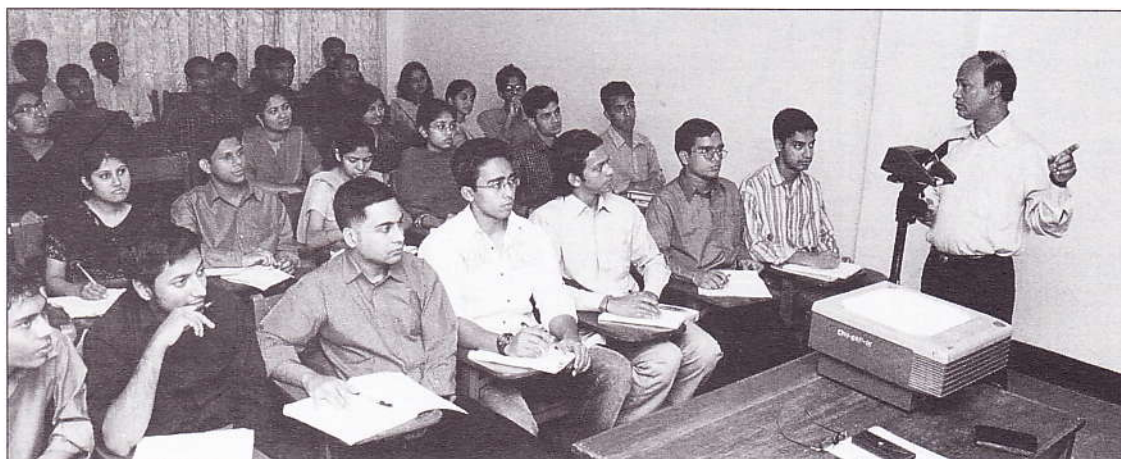
A BBA Class in Progress

Faculty Members of the Department

Professor

Mr. Mohammad Musa
Ph.D. in Finance
University of Wisconsin-Milwaukee

Mr. Abdul Mannan
MBA in Marketing
University of Hawaii, Hawaii U.S.A

Mr. Md. Saleh Uddin
Ph.D. in Economics
University of Malaya, Kuala Lumpur,
Malaysia

Mr. Md. Abdul Hye
Ph.D. in Accounting, University of Dhaka.

Associate Professor

Mr. S I Nusrat A Chaudhury
MBA in Finance, Keller Graduate School
of Management, U.S.A

Mr. Tanbir Ahmed Chowdhury
Ph.D. in Financial Management &
Quantitative Techniques, Pune University,
Poona, India

Assistant Professor

Mr. Kazi Khaled Shams Chisty
MBA Columbia State University USA

Mr. Golam Ahmed Faruqui
Ph.D. in Finance
La Salle University, USA

Mr. S. S. M. Sadrul Huda
M. Sc. in Leisure & Environment
Wageninjen Agricultural University
The Netherlands

Mr. Nahid Hasan Khan
M.Com in Accounting
University of Dhaka

Mr. Kamrul Hassan
MBA in Finance, IBA, University of Dhaka.

Senior Lecturer

Ms. Rubina Islam Ahmed
MBA, Independent University Bangladesh
(on leave)

Mr. Mohammad Behroz Jalil
MBA (Human Resource), Institute of
Business Administration (IBA)
University of Dhaka

Mr. Hasan Shirazi
MBA, East West University

Mr. Bashir Hussain
MBA in Business, William Paterson
University, USA

Mr. Omar Faruq
MBA, University of Hull, UK

Mr. Mohammad Abdur Razzak
LL.M. (Specialized)
University of Nottingham

Mr. M Shakhawat Hossain
MBA in HRM & Marketing
East West University

Mr. Chowdhury Golam Hossan
Masters in E-Business Management
International University of Japan

Mr. Abir Shawkat Haiat
M.Com. in Management
University of Dhaka

Mr. Muhibbul Islam
MBA (Executive Program) in Human
Resource Management and Finance
East West University

Lecturer

Mr. Fazluz Zaman
Master in International Business
University of Wollongong, Sydney

Mr. Jashim Uddin
MBA in Major in Strategic & International
Management, University of Dhaka

Mr. Md. Lutfur Rahman
MBA in Finance, University of Dhaka

Ms. Shehely Parvin
MBA in Marketing, University of Dhaka

Ms. Farhana Ferdousi
MBA in Management Information System
University of Dhaka

Mr. Tahmid Nayeem
MBA in Management of IT
Schiller International University
London, UK

Mr. Mohammad Zakaria Masud
MBA in Accounting, University of Dhaka

Mr. Md. Habib-uz-Zaman Khan
MBA in AIS, University of Dhaka

Ms. Sarwat Amina
MBA, IBA, University of Dhaka

Mr. Nakibur Rahman
M.Sc. In Information Systems
University of Maine, Maine, USA

Mr. M Sayeed Alam
MBA in Marketing, North South University

Mr. Md. Shahriar Akter
MBA in Marketing, University of Dhaka

Mr. Mohammad Ismail Hossain
MBA in Marketing, University of Dhaka

Mr. Nikhil Chandra Shil, CMA
MBA & BBA, Department of accounting
and Information System, Faculty of
Business Studies, University of Dhaka

Adjunct Faculty

Mr. Syed Ferhat Anwar
Ph.D. (Study of the Marketing System in the Informal
Manufacturing Sector), Joint Program, University of New
Branswick, Canada & University of Dhaka; DUT

Mr. A.T.M.Tofazzel Hossain
Ph.D. Finance , Kalyani University. India

Mr. Mahmud Zubayer
MBA in International Business
Florida Metropolitan University, USA

Mr. A.K. Nazmul
Master of Science in Human Resource Development
Towson University, Toronto, Canada

Ms. Tanzina Haque
Master of Business Administration (Major in Accounting)
University of Dhaka

Mr. Md. Wahidul Habib
M. Com. in Marketing, University of Dhaka

Mr. Ahmed Wakaar Raja
MBA in International Business, Luton Business School (LBS)
University of Luton, Bedfordshire, UK

Ms. Ireen Akhter
Master of Business Administration, major in Human Resource
Management and minor in Finance
Institute of Business Administration, University of Dhaka

Mr. Md. Zahir Uddin Arif
M.Com. (Marketing), University of Dhaka

A BBA Class in Progress

Department of Economics

The Department of Economics at the East West University is aiming to be one of the most prestigious department in economics in Bangladesh. It has a strong teaching faculty comprising of highly qualified and experienced professors as well as bright young economists. Research is of high priority in the department.

Economics is also the most vibrant of all social sciences in modern history. Learning Economics has always been most fascinating for brilliant students. Its academic challenges is the envy of most other sciences. At East West University, the BSS program in Economics is designed to meet the challenges of modern time. Students are trained in both theoretical and applied aspects of Economics, Development, and Business. Keeping in view with the demand in the job market, programs in Economics are flexible but rigorous to grip on the challenges of globalization.

The Department offers BSS in Economics with options to complete a Second Major in Management, Marketing, Finance, Computer Science, English or in any other undergraduate disciplines available at EWU.

The Department also offers a multidisciplinary program at the graduate level. The Master in Bank Management is designed to produce the efficient workforce for banking and financial organizations. The Department has developed its second multidisciplinary graduate program in Development Studies with specializations in Evaluation and Design, Development Studies, Development Policy and Development Management. Master in Development Studies is intended to be the best academic program in the country in this field. Furthermore, the Department is currently working on developing curriculum for the Master in Economics and Law, the Master in Public Policy, and Master in Economics.

Faculty Members of the Department

Professor

Mr. Mohammed Farashuddin
(PhD in Economics, Boston University, USA)
Professor and Chair, Founder Vice Chancellor (1996-1998), East West University; Former Governor, Bangladesh Bank (1998-2001).

Mr. M Saleh Uddin
Ph.D. in Economics
University of Malaya, Kuala Lumpur, Malaysia

Mr. A.K.Enamul Haque
(PhD in Natural Resource Economics, University of Guelph, Canada) Founder Dean, School of Business, Bangladesh Open University; Former Chair and Professor of Economics, North South University. Member of the Management and Advisory Committee, South Asian Network for Development and Environmental Economics (SANDEE).

Mr. Syed Shahadat Hossain
Ph.D. in Statistics, Deakin University, Australia

Associate Professor

Mr. Abdus Sattar
Ph.D (Statistics), Kiev Institute of National Economy Kiev, Ukraine

Mr. Abdul Wadud
(PhD in Economics, New Castle, UK)

Senior Lecturer

Ms. Jahida Gulshan
M.Sc.(Statistics), University of Dhaka. (on leave)

Mr. Md. Abdus Salam
Ph.D. in Mathematics, Calcutta University, India

Lecturer

Ms. Shajeda Khanom
M.Sc. in Pure Mathematics (Thesis Group) Univerisity of Dhaka

Mr. Iftekharul Huq
(MSc in Economics, Warwick, UK)

Mr. Arup Kumar Sinha
M.Sc. In Statistics, University of Dhaka

Ms. Biva Arani Mallik
(MA in Economics, York University, Canada)

Mr. Ahmed Taneem Muzaffar
M.Sc. in Financial and Business Economics

Mr. Mainul Islam Chowdhury
Master of Arts in Business Economics
Wilfrid Laurier University, Waterloo, Ontario, Canada

Adjunct Faculty

Ms. Farah Hasin
Ph.D. in Economics, University of London, UK

Mr. Md. Showkat Ali
Ph.D. From University of Glasgow, UK

Mr. Mainul Islam Choudhury
Master of Arts in Business Economics
Wilfrid Laurier University, Waterloo, Ontario, Canada

Mr. Kazi Aminur Rahman
M.Sc. In Applied Mathematics, University of Dhaka

Ms. Saiyeeda Saniya Munim
MA (Economics), York University, Toronto, Canada

Ms. Azreen Karim
MS (Economics), York University, Canada

Visiting Faculty

The Department strongly believes in academic interactions with other economics departments at home and abroad. As such, 20 percent or so courses are usually planned to be taught by visiting faculty members from reputed universities at home and abroad.

Academic Programs
Undergraduate Studies
Bachelor in Social Science (Economics) - 123 Credits

Graduate Studies
Master of Bank Management - 60 credits
Master of Development Studies - 36 credits (under advanced stage of approval)
Master of Economics and Law - 50 credits (under preparation)
Master of Public Policy - 30 credits (under preparation)
Master of Economics - 30 credits (under preparation)

Research
In close collaboration with the East West University Center for Research and Training (EWUCRT), the department is planning to undertake policy research particularly relevant to the macroeconomic and social policy framework of the country. The department envisages significant research involvement in the areas of environment, resource planning and entrepreneurship development.

ECONOMIC TRANSFORMATION AND SOCIAL DEVELOPMENT IN BANGLADES
Organized by
EAST WEST UNIVERSITY
and
Econo...esearch Group
Sa...ay, 30 April 2005
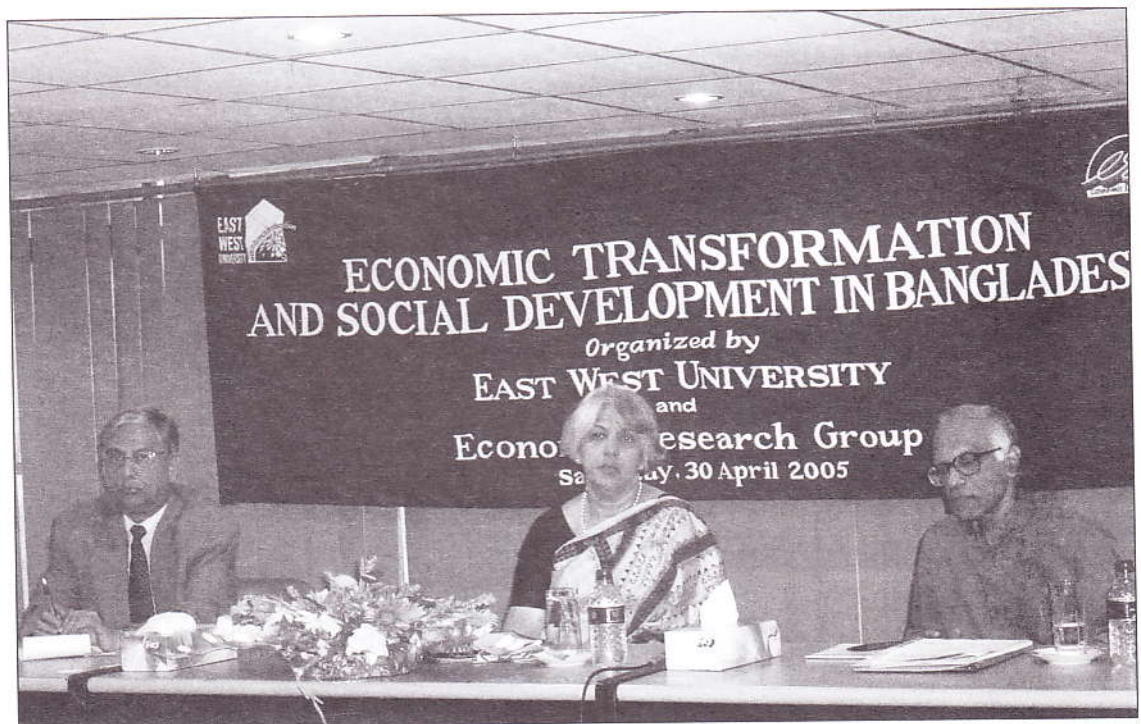
Dr. Mohammed Farashuddin, Dr. Isher J. Ahluwalia and Professor Wahiduddin Mahmud in a seminar
at East West University

Bachelor of Social Science (BSS) in Economics
Minimum Requirement 123 Credits

Course	Title	Credit
General Education Requirements		33
Compulsory General Education Courses		24
BUS 101	Introduction to Business	3
CSE 101	Introduction to Computers I	3
ENG 100	Spoken English	3
ENG 101	Basic English	3
ENG 102	Composition and Communication Skills	3
GEN 201	Bangladesh Studies	3
MAT 110	Mathematics For Business and Economics I	3
STA 101	Introduction to Statistics	3

Course	Title	Credit
Optional General Education Courses		9
Choose three courses from		
CSE 102	Introduction to Computers II	3
GEN 202	Eastern Culture and Heritage	3
GEN 203	Ecological System and Environment	3
GEN 204	Western Thought	3
GEN 205	Introduction to Psychology	3
GEN 206	Introduction to Sociology	3
GEN 207	Industrial Psychology	3
GEN 210	International Relations	3
GEN 212	Women in development	3
MAT 100	College Mathematics (Compulsory for those students who have no mathematics in HSC or equivalent level)	3

Course	Title	Credit
Core Requirements		54
ECO 101	Principles of Microeconomics	3
ECO 102	Introduction to Macroeconomics	3
ECO 260	Environmental & Natural Resource Economics	3
ECO 301	Intermediate Microeconomic Theory I	3
ECO 302	Intermediate Macroeconomic Theory I	3
ECO 310	Money and Banking	3
ECO 315	Public Finance	3
ECO 328	International Trade and Finance	3
ECO 349	Economics of Development	3
ECO 360	Socio-Economic Profiles of Bangladesh	3
ECO 465	Basic Econometric	3
ECO 467	Intermediate Microeconomic Theory II	3
ECO 475	History of Economic Thought	3
ECO 477	Intermediate Macroeconomic Theory II	3
ECO 490	Research Methodology	3
ECO 495	Supervised Research Paper	3
MAT 211	Mathematics for Business and Economics II	3
STA 217	Statistics For Business And Economics	3

Course	Title	Credit
Open Elective Courses		36
NOTE 1	At least 15 credits must be from ECOXXX	
NOTE 2	Students may choose to use OE credits towards their minor/major in other disciplines	
ECO 2XX	Any 1 courses from 200 level	3
ECO 200	Agricultural Economics	3
ECO3XX	Any 5 courses from 300 level	15
ECO 304	Economics of Health	3
ECO 314	Public Sector Economics	3
ECO 354	Environmental & Natural Resource Economics II	3

Course	Title	Credit
ECO4XX	Any 6 courses from 400 level	18
ECO 450	Labor Economics	3
ECO 480	Urban Economics	3
ECO 484	Project Analysis and Evaluation	3
ECO 485	Cost Benefit Analysis	3
ECO 486	Energy Economics and Policy	3
ECO 490	Industrial Organization	3
ECO 491	Welfare Economics	3
ECO 492	Law and Economics	3

Course	Title	Credit
Concentration Courses (counted inside OE credits)		15
NOTE Concentration is not mandatory for students		
a) Concentration in Business Economics		
Choose five courses from		
ACT 101	Financial Accounting	3
ECO 460	Managerial Economics	3
FIN 425	Investment Analysis and Management	3
FIN 465	International Financial Management	3
ITB 301	International Business	3
MGT 101	Principles of Management	3
MGT 337	Production Operations Management	3
MKT 101	Principles of Marketing	3
MKT 408	International Marketing	3

Course	Title	Credit
b) Concentration in Advanced Economic Theory		
Choose five courses from or from OE courses 3XX and above		
ECO 357	Mathematical Economics	3
ECO 447	Applied Economics	3
ECO 449	Economics of Information	3
ECO 453	Game Theory and Applications	3
ECO 474	Mathematical Economics II	3
ECO 487	Applied Econometrics	3
MAT 407	Advanced Calculus	3
MAT 470	Real Analysis	3
STA 427	Mathematical Statistics	3

c) Concentration in Trade and Development

Choose five courses from

ECO 304	Economics of Health	3
ECO 329	Contemporary Issues in International Economics	3
ECO 353	Economics of Development in South Asia	3
ECO 382	Economic Valuation of Enviornment	3
ECO 406	International Economic Theory	3
ECO 414	Trade Policy Analysis:	3
ECO 433	Gender & Development:	3
ECO 443	Social Mobilization, Rural Banking and Community Organization	3
FIN 465	International Financial Management	3

Second Major in Economics

The following curriculum for completing a Second major for non-Economics undergraduate student in EWU.

Once a student earns a second major his/her degree will have a suffix Economics, like BBA (Marketing and Economics), B.Sc (Pharmacy and Economics), etc.

A second major in Economics is open to all undergraduate students in EWU who are not enrolled in BSS Economics students. The credit requirement for this second major is as follows:

a) **Compulsory Credits**	39 credits
b) **ECO 3XX/ECO 4XX level credits**	6 credits
Total Credit Requirement	**45 Credits**

Economics Courses	
Credit Hour Requirement for Second Major	45
Required core courses	39
ECO 101 Principles of Microeconomics	3

ECO 102	Introduction to Macroeconomics	3
ECO 315	Public Finance	3
ECO 260	Environmetal & Natural Resource Economics	3
MAT 110	Mathematics for Business and Economics I	3
STA 101	Introduction to Statistics	3
ECO 301	Intermediate Microeconomic Theory I	3
ECO 302	Intermediate Macroeconomic Theory I	3
ECO 467	Intermediate Microeconomic Theory II	3
ECO 477	Intermediate Macroeconomic Theory II	3
MAT 211	Mathematics for Business and Economics II	3
STA 217	Statistics for Business and Economics	3
ECO 465	Basic Econometric	3

ECO 3XX	OR ECO 4XX	6
ECO 304	Economics of Health	3
ECO 310	Money and Banking	3
ECO 314	Public Sector Economics	3
ECO 328	International Trade and Finance	3
ECO 349	Economics of Development	3
ECO 354	Environmental & Natural Resource Economics II	3
ECO 360	Socio-Economic Profiles of Bangladesh	3
ECO 450	Labor Economics	3
ECO 475	History of Economic Thought	3
ECO 480	Urban Economics	3
ECO 484	Project Analysis and Evaluation	3
ECO 485	Cost Benefit Analysis	3
ECO 486	Energy Economics and Policy	3
ECO 490	Industrial Organization	3
ECO 491	Welfare Economics	3
ECO 492	Law and Economics	3
ECO 495	Research Methodology	3

Students in the Computer Lab

Department of English

The Department of English is one of the earliest departments to have been set up at East West University. Beginning with only one faculty member in August 1996, it now has 17 full-time and 2 part-time faculty members. The Department itself was officially established in 1997. At the outset it functioned only as a "service" department; now it offers a broad range of undergraduate and graduate courses in English language and literature to about 240 students as well as a number of compulsory courses for students of other departments of the university. At this point, 41 students have received their B. A. (Hons.) degrees from the department. In addition, 7 students have by now graduated with M. A. in English degrees from it.

The mission of the English department includes: a) to make all East West University students proficient in the English language so that they can read texts written in English without any difficulty and can speak and write it fluently; b) to produce graduates who will have mastered English literature and acquired expertise in English language teaching; c) to foster humane values in East West students through the reading of the classics of English literature and to nurture and develop the sensibility of East West students; d) to produce students who can work as teachers, administrators, journalists, translators, editors, and consultants through courses such as English for Professional Communications, English for Specific Purposes; Business English, Cultural Studies, Translation Studies, English for the Media, etc; e) to follow the latest developments in literary and linguistic theory and to adopt the best teaching strategies to produce students who can cope with changing times; f) to contribute to the study of the English language and literature through research and scholarship.

At present, the English department plays a key role in East West University's academic activities. Faculty members draw on their expertise gained from studies abroad and from experience gained through scholarship and fieldwork to offer quality education across the curriculum. Quite a few of them have been trained in leading universities of North America, Britain and Australia. The department is particularly strong in ELT methodology, South Asian Writing in English, and Composition. It sponsors three EW Clubs directly: the English Conversation Club and the Poetry and Drama clubs. Faculty development and research is strengthened by a regular lecture series where scholarly papers are presented and discussed.

The English department intends to develop fully into a centre specializing in teaching English across the curriculum, ELT, and the new literatures in English while continuing to offer core courses in traditional English studies. It plans to play a key role in East West University's search for excellence in education, both by providing the University's students language skills that will enable them to carry out higher education and by ensuring that faculty members keep up with the latest developments in ELT pedagogy and Literary and Linguistic Theory.

The general and specific curriculum objectives are as follows:

General

a) Promote liberal humanitarian values through the study of the masterpieces of English and American literature, non-native writings in English, cultural studies, postcolonial studies etc.

b) Polish, refine and develop sensibilities and cultivate professionalism in manner and behaviour of students to prepare them to be successful future leaders/civil administrators.

c) Strengthen the moral fabric of students and develop their ability to distinguish right from wrong.

d) Promote humanitarian causes in a world dominated by commercial motives.

Specific

a) To develop excellent communication skills in English, since it is the gateway to success in professional life nationally and internationally.

b) To prepare good English language and literature teaching professionals to cater to the need for skilled English teachers at the tertiary level in Bangladesh, who will, in turn, help train teachers for secondary and primary levels.

c) To train students as course curriculum designers for English language programs in the country.

d) To train students as English text book/material designers so that they can produce culture and context-sensitive ELT materials.

e) To enable students to design and mark English language tests so that they can evaluate tests of English language and literature and also work as trainers and assessors of standard international English language tests such as IELTS and TOEFL.

f) To develop translation skills (for translating our literature into English and translating foreign literature, textbooks on different subjects from English to Bangla).

g) To impart knowledge and skills required to work with the media, e.g. as newseditors in TV and as sub-editors in newspapers.

h) To impart training in creative writing in English so that through their own creative writing they can familiarize foreign nationals with our culture.

To meet these objectives the programme includes 4 major areas:

    (1) language skills development

    (2) literature

    (3) linguistics and

    (4) English language teaching.

There are three different options:

a) Students can take all 10 elective courses from Literature concentration (Concentration A)

b) Students can take all 10 elective courses from Linguistics, ELT/Applied Linguistics concentration (Concentration B)

c) Students can take any 10 courses from both concentrations (from Concentration A and B above)

To complete the BA in English degree at EWU one has to successfully complete at least 123 credits. The courses that are offered for English Department students are displayed in the following page.

Prize winners of East West University-Prothom Alo-Mutual Trust Bank Students' Quiz Competition with the Hon'ble Health & Family Welfare Minister Dr. Khandaker Mosharraf Hossain, MP

Bachelor of Arts (BA) in English
Minimum Requirement 123 Credits

Course	Title	Credit
General Requirements		33
Compulsory General Education Courses		18
BUS 101	Introduction to Business	3
CSE 101	Introduction to Computers 1	3
ENG 100	Improving Oral Communication Skills	3
ENG 101	Basic English	3
ENG 102	Composition and Communication Skills	3
GEN 201	Bangladesh Studies	3

Course	Title	Credit
Optional General Education Courses		15
Choose five courses from		
CSE 102	Introduction to Computers 2	3
GEN 202	Eastern Culture and Heritage	3
GEN 203	Ecological System and Environment	3
GEN 205	Introduction to Psychology (Compulsory for English Dept. Students)	3
GEN 206	Introduction to Sociology (Compulsory for English Dept. Students)	3
GEN 207	Industrial Psychology	3
GEN 208	Introduction to Philosophy (Compulsory for English Dept. Students)	3
GEN 209	Social Psychology	3
GEN 211	Concept of Journalism and Media (Compulsory for English Dept. Students)	3
GEN 212	Women in Development	3

Course	Title	Credit
Core Requirements		60
ENG 145	Introduction to Linguistics	3
ENG 154	English Phonetics and Phonology	3
ENG 155	Improving Reading and Writing Skills	3
ENG 191	Introduction to Literature: Fiction and Non-Fiction Prose	3
ENG 192	Introduction to Literature : Poetry and Drama	3
ENG 205	History of the English Language	3
ENG 207	Psycholinguistics	3
ENG 208	Sociolinguistics	3
ENG 209	Political and Social History of England	3
ENG 230	Nineteenth Century Novel	3
ENG 245	Romantic Poetry	3
ENG 301	Elizabethan and Restoration Drama	3
ENG 306	Methodology of Language Teaching	3
ENG 309	Advanced Reading and Writing	3
ENG 310	Shakespeare	3
ENG 315	Seventeenth and Eighteenth Century Poetry	3
ENG 403	Modern Novel	3
ENG 412	Techniques of Teaching English Language Skills	3
ENG 426	American Literature (Modern to Contemporary)	3

Course	Title	Credit
ENG 438	Literary Criticism	3

Course	Title	Credit
Elective Requirements		30

Students will select ten courses from one of the two following concentrations including ENG 440: Literary Theory.

Course	Title	Credit
Concentration A: Literature		
ENG 320	Victorian Prose and Poetry	3
ENG 330	English Prose From Bacon to Swift	3
ENG 340	Eighteenth Century Fiction	3
ENG 410	Continental Literature	3
ENG 420	American Literature (1620-1891)	3
ENG 423	Old and Middle English	3
ENG 424	Classics in Translation	3
ENG 430	Cultural Studies	3
ENG 435	Postcolonial Theory and Literature	3
ENG 440	Literary Theory	3
ENG 445	Modern Poetry	3
ENG 450	Modern Drama	3
ENG 452	Contemporary Literature in English	3
ENG 455	Comparative Literature	3
ENG 458	Feminist Readings of Literature	3

Course	Title	Credit
Concentration B: ELT/Applied Linguistics		
ENG 200	Advanced Oral Communication Skills (Open elective)	3
ENG 201	Theories of Writing	3
ENG 226	Business and Profession Communication (Open elective)	3
ENG 235	Teaching Language through Literature	3
ENG 303	Syllabus and Material Design	3
ENG 305	Linguistic Theories	3
ENG 307	Academic Writing	3
ENG 313	English for the Media (Open elective)	3
ENG 316	English for Specific Purposes	3
ENG 319	Translation Studies (Open Elective)	3
ENG 402	Pragmatics and Discourse Analysis	3
ENG 405	Creative Writing	3
ENG 411	Language Acquisition Theories for EFL/ESL Contexts	3
ENG 413	Language Testing and Evaluation	3
ENG 414	Research Methodology in ELT	3
ENG 415	Language Policy and Planning	3
ENG 417	Problems & Prospects of ELT in Bangladesh	3
ENG 422	Bilingualism and EFL/ESL	3
ENG 436	ELT Research Project	3
ENG 451	Computer Assisted Language Learning/Teaching (CALL/CALT)	3

Faculty Members of the Department

Professor

Mr. Fakrul Alam
Ph.D. in English, University of British
Columbia, Canada

Mr. M. Shahidullah
Ph.D. in ELT, University of Pune

Ms. Rebecca Sultana
Ph.D. in Postcolonial Theory and Literature
Texas Christian University Fort Worth, Texas, USA.

Associate Professor

Mr. Asit Roy Choudhury
Post-graduate Diploma in TESL/TEF
University of Wales, U.K

Assistant Professor

Mr. Harunur Rashid Khan
M. A. in Applied Linguistics
Victoria University of Wellington, New Zealand

Mr. Shafiqur Rahman
MA in English Language
University of Toledo, Ohio, USA

Ms. Tahmina Begum
M.Ed. In Applied Linguistics
Columbia University

Senior Lecturer

Ms. Masrufa Ayesa Nusrat
M.A in English Studies,
University of Nottingham, UK

Ms. Farzana Akhter
M.A. in English, University of Dhaka

Mr. Zahid Akter
M. Phil. in Applied Linguistics & ELT, University of Dhaka

Ms. Afia Arafat
M.Phil (English Literature)
School of Critical Humanities, Central Institute of English and
Foreign Languages (CIEFL) Hyderabad, India

Lecturer

Mr. Bijoy Lal Basu
M.A. in Applied Linguistics and ELT
University of Dhaka

Mr. Hasan Al Zayed
M.A. in English, Jahangirnagar University

Mr. Subrata Kumar Bhowmik
M.A. in Applied Linguistics and ELT
University of Dhaka

Mr. Muhammad Manzur Alam
M.A. in English Literature
University of Dhaka

Ms. Iffat Jahan
M.A. in Applied Linguistics & ELT
University of Dhaka

Mr. Zohur Ahmed
M.Phil. in ELT
Central Institute of English and Foreign
Languages, India

Mr. Manzoorul Abedin
M.A. in Applied Linguistics and ELT
Department of English, University of Dhaka

Ms. Sarmista Mondol
MA in English Literature, Central Institute of English & Foreign
Languages, Hyderabad, India

Ms. Iffat Sharmin
Master of Arts in English, East West University

Adjunct Faculty

Mr. Syed Manzoorul Islam
Ph.D. from Queen's University, Kingston, Canada

Mr. Kaiser Hamidul Huq
Ph.D. in English Literature, University of Warwick, England
M.A. in English

Ms. Ruma Khalil Choudhury
Master of Arts in English, California State University

Department of Social Sciences

The Department of Social Sciences is the newest of East West University's departments and started functioning on June 01, 2005. It offers non-degree courses for the students of other departments helping them in fulfilling their requirements. The Department of Social Sciences offers courses in the following disciplines as:

Bangladesh Studies
Eastern Culture and Heritage
Ecological System and Environment
Western Thought
Introduction to Psychology
Introduction to Sociology
Industrial Psychology
Introduction to Philosophy
Social Psychology
International Relations
Concepts of Journalism & Media Studies
Women in Development

Students of all other undergraduate programs and departments at EWU are required to complete 12 credits of their total credit requirement through these courses. Department of Social Sciences offers these courses, conducts examinations, and publishes grades. This department will soon offer minor in one or more disciplines in the social sciences. In future this department intends to offer degrees in Women's issues and Public Administration, and is set to become as a full-fledged degree awarding department.

Department of Social Sciences is an integral part of EWU. It hopes also to offer it's services to people of the country to promote social and human resource development. The major goals of the Social Sciences Department are:
1. To provide programs that promote knowledge in the Human Sciences, History and Culture, and Development;
2. To contribute for community and national development;
3. To create human resources with good critical thinking skill, and equip them with tools for social reform.

Faculty Members of the Department

Professor
Ms. Nasreen Wadud, Ph.D.
Ph.D. in Psychology
Industrial/ Organizational Psychology
University of Delhi, Delhi, India

Senior Lecturer
Ms. Touhida Tasnima
M.S.S. in Public Administration
University of Dhaka, Bangladesh

Mr. Sudhangshu Sekhar Roy
Masters in Mass Communication and Journalism
University of Dhaka, Bangladesh

Lecturer
Mr. Suman Dhar
M.S.S. in Sociology, University of Dhaka, Bangladesh

Adjunct Faculty Member
Mr. Md. Golam Dastagir
Ph.D. in Philosophy and Religion
University of Hull England, UK

Mr. A.M.M. Shawkat Ali
Ph.D. in Public Administration
University of Tasmania, Australia

Mr. Ehsanul Haque
M.A. in International Affairs, Ohio University, USA

Mr. Hasan Mahmud
Ph.D. in Environmental Chemistry
Limburg University Centrum, Belgium

Ms. Ferdous Arfina Osman
Ph.D. in Public Administration, University of Manchester, UK

Ms. Ware Newaz
Ph.D. in Administrative Science, University of Tampere
Finland Mphil in Public Administration
University of Bergen, Norway

Mr. Fazlur Rashid Khan
Ph.D. in Sociology, University of Edinburgh U.K

Ms. Nasheeba Selim
Masters in Gender Studies, Saint Mary's University, Halifax NS, Canada

Mr. Ahmed T. Rashid
M.A. in International Development Studies
Saint Mary's University, Halifax, NS, Canada

Department of Applied Physics & Communications Engineering

Introduction

The Department of Applied Physics & Communications Engineering (APCE) at East West University is housed under the faculty of Sciences and Engineering and is relatively a new Department of the university. The Department has, at present, 13 teaching faculty members, among which 9 are full-time and 4 are Visiting/Adjunct. The Department is going to recruit few more teaching faculty members very soon. Apart from the 13 faculty members, there are some Teaching Assistants working in the Department.

The APCE Department offers the core and some elective courses of the undergraduate ICE program and the following basic science courses for different undergraduate degree programs under the faculty of Sciences & Engineering of the university: PHY 100, PHY 101, PHY 102; MAT 101, MAT 102, MAT 104, MAT 201, MAT 301 and STA 102. Detail contents of the above courses are described elsewhere in the brochure.

Faculty Members of the Department

Professor

Mr. A. S. A. Noor
Ph.D., Flinders University of S. A., Australia, 1980, Lattice Theory; MSc, University of Rajshahi, 1970, Mathematics; Professor.

Mr. Ajit Kumar Majumder
Ph.D., Monash University, Australia, 1999, Econometrics; M.Sc, Jahangirnagar University, 1982, Statistics; M.S., Victoria University, Canada, 1988, Statistics; Professor (Visiting).

Mr. M. Ruhul Amin
Ph.D, University of St Andrews, U.K., 1990, Theoretical Plasma Physics; MSc, Jahangirnagar University, 1986, Physics; Professor & Chairperson.

Associate Professor

Syed Anisul Haque
Ph.D, JAIST, 2002, Nanoscale Materials Science & Engineering; M.Sc., University of Rajshahi, 1992, Applied Physics & Electronics; Postgraduate Diploma in Computer Science, Cambridge University, England; Associate Professor.

Mr. K.M. Rezanur Rahman
Ph.D, Russian People's Friendship University, Moscow, Russia, 1996, Photoelectronics & Integrated Optics; M.Sc., Russian People's Friendship University, Moscow, 1991, Physics; Associate Professor (Visiting)

Mr. M. Rafiqul Matin
M.Sc., Bangladesh University of Engineering & Technology, 1991, Electrical & Electronic Engineering; MBA, North South University, 2003; Associate Professor (Visiting)

Assistant Professor

Mr. Khandker Saadat Hossain
Ph.D. in Biopolymer Physics, Kyushu University, Japan, 1999 M.Sc., University of Dhaka, 1994, Physics; Assistant Professor.

Mr. Imdadul Islam
M.Sc., Bangladesh University of Engineering & Technology, 1998, Electrical & Electronic Engineering; Assistant Professor (Visiting).

Senior Lecturer

Ms. Anindita Paul
M.Phil, BUET, 2005, Mathematics; Game Theory; M.Sc, Jahangirnagar University, 1998, Mathematics; Senior Lecturer.

Mr. G. Mandal
Ph.D, University of Pune, India, 2003, Atmospheric Physics; M.Sc, Jahangirnagar University, 1990, Physics; Senior Lecturer.

Mr. Mustafa Mahmud Hussain
M.Sc., King's College, University of London, U.K., 2003, Telecommunications Engineering; Senior Lecturer.

Lecturer

Mr. M. Rakibul Hasan
M.Sc., London Metropolitan University, U.K., 2003, Software Engineering; Lecturer.

Mr. Adnan Rab
M.Sc., University of New South Wales, Australia, 2002, Telecommunications Engineering; Lecturer.

Academic Programs

At present, this Department offers undergraduate degree program in Information & Communications Engineering (ICE). Process of starting Master of Science (M.S) programs in Telecommunications Engineering (TE) as well as in Applied Physics & Electronics (APE) under this Department is underway. The Department is also planning to initiate undergraduate degree program, Bachelor of Science (B.Sc.) in Applied Physics & Electronics in the near future.

Research

The present research activities of the Department include research work in the fields of Wireless & Mobile Communications, Digital Signal Processing, Plasma Physics, Nanoscale Materials Science, Biopolymer Physics, Atmospheric Physics, Lattice Theory, and Game Theory.

The Undergraduate Curriculum for the Bachelor of Science (B.Sc.) in Information & Communications Engineering

Information & Communications Engineering (ICE) is the subject of creation, gathering, processing, storage, and delivery of information and the creation of communication devices and systems that allow these to happen. Naturally, telecommunications engineering is the main field that falls under this category. Our civilizations now depend absolutely upon ICE. The Internet and the World Wide Web are perhaps the most visible applications of ICE. Applications include satellite communications, next generation mobile phones, digital high definition television, video on demand systems replacing videotape libraries, air traffic control, car and aircraft navigation systems, medicine, and even the production of network based computer games.

Our B.Sc. in ICE is designed to equip its graduates for careers in the design, development and management of information networks. These can range from small company local area networks (LANs) to the global telephone and Internet networks, which are now converging towards a single entity. The program is very much concerned with the essential (but usually invisible) backbone or infrastructure of data communications systems that connects all the phones, faxes, computers and other multimedia services, some of which do not yet exist.

This curriculum for the undergraduate degree program is based on the believe that in a discipline that is changing at a rapid pace, it is necessary to provide the students with intellectual rather than only technical skills. Accordingly, the curriculum is based on a broad coverage of the disciplines of Electrical, Computer and Telecommunications Engineering and specialization can be provided by a choice of subjects in the final year and in the final year project work or industrial training. The objective of the course curriculum is to provide engineering graduates with the disciplines and skills needed to design modern communications systems.

It should be mentioned here that, our B.Sc. program in ICE should be equivalent to the B.Sc. in the following disciplines of other universities of the country:

- Electronics & Communications Engineering (ECE)
- Electronic & Telecommunications Engineering (ETE)
- Information & Communications Technology (ICT)

Information and communications engineering and the closely related area of computer systems engineering are projected to have strong and accelerating employment growth for the foreseeable future. Career prospects for the graduates in this field are excellent.

Goal of the B.Sc. in ICE

- Our undergraduate curriculum is designed in such a way that after graduation the graduates will have a reasonable amount of general idea about humanities subjects and they will obtain a good communication skill in English as well. The curriculum includes a good number of optional general education courses from which students can choose the required number of courses according to her/his interest. Examples of some of the general courses are: psychology, sociology, philosophy, international relations, journalism and media studies. In addition to these, a student must take a basic business course and a course from non-engineering subjects.

- To study science and engineering in advanced levels, one needs to acquire a good knowledge in mathematics and physics. Our curriculum contains quite a few numbers of basic and fundamental mathematics and physics courses. For example, this curriculum includes the following courses on mathematics and statistics: statistics & probability, calculus, differential equations & special functions, linear algebra, complex variables & mathematical transforms. It also includes two basic courses on physics: a basic physics course containing waves and oscillations, fluid dynamics, heat & thermodynamics; and the other course contains electricity, magnetism and physical optics.

- To study telecommunications engineering in depth, a thorough knowledge in electronic devices and circuits is a must. The present curriculum includes a reasonable number of electronics courses. This curriculum includes the following electronics courses: electric circuits & networks, basic electronics & devices, electronic circuits, digital electronics and a course on microprocessors and interfacing.

- In recent years, modern telecommunications engineering has been merged with computer systems engineering. In our curriculum, we have included almost all-basic computer science courses, such as computer fundamentals and programming language, object oriented programming with C++, discrete mathematics & numerical methods, data structure & algorithm, database management systems, programming with Java, computer organization & operating systems, etc. So that our graduates can work in computer systems industries in addition to working in telecommunications industries.

- Digital signals processing is very important for telecommunications. We cover a vast syllabus on signals and systems as a core course. We have also included an advanced course on digital signal processing in the final year of the curriculum.

- In the present time, wireless & mobile communication is a rapidly growing field. Because of the rapid growth in the industry, we have included a course detailing almost all-current topics of this subject including IMT 2000. Although this subject is usually taught in masters or higher levels but we have included it in our undergraduate curriculum because of the market demand.

- In the present curriculum, we have included quite a few number of need based advanced courses in computer science and telecommunications. For example, we have courses like satellite communications, artificial intelligence & expert systems, neural networks, VLSI engineering, robotic technology, broadband networks and multimedia communications technology. These courses are having greatest impact in the science of computer systems engineering as well as in modern telecommunications engineering.

- Students will also undertake an extensive project work or industrial training in the final year of their study. This project work or industrial training is a key element of the program, which will give the students the opportunity to put the knowledge and skills they have acquired into practice.

- The curriculum has been designed in such a way that a student first obtains a general foundation in information & communications engineering by studying basic courses on computer science and telecommunications. Then she/he can prefer to go for either in the computer systems engineering or in the telecommunications engineering in depth by studying relevant advanced courses included in the elective course module. However, since our curriculum is designed to include almost all basic and fundamental courses of the two streams, a graduate of this curriculum will be appropriate to work in industries related to computer systems as well as telecommunications engineering.

Responsibilities of ICE Engineers

ICE engineers are responsible for the planning and design, commissioning, performance monitoring, optimization and management of complex telecommunications system. Some important activities of an ICE engineer are

- Management of engineering teams

- Design and implementation of telecommunications equipments like modems, switches, routers and radio links

- Developing real-time computer systems including imbedded computer systems and their software

- Building and testing prototypes of new equipment including integrated circuit components

- Predicting telecommunication systems performance based on simulation of real-life environment

- Taking action to optimize the performance of telecommunications systems

- Providing technical support to marketing or customer service staff and telecommunications technicians

- Providing training for technical and engineering staff once new systems have been installed

- Supervising special research projects on next generation telecommunications systems

- To synchronize themselves to the radical changing technology of telecommunications.

Employment Opportunities for the ICE Graduates

- Mobile Phone operators, for example: BanglaLink, GrameenPhone, AKTEL, City Cell, TeleTalk etc. and other relevant multinational companies abroad

- BTTB; the graduates can complete BCS examination for relevant government jobs

- Any organization related to computer networking and IT, such as software firms, ISPs, banking systems etc.

- Different electronics industries, such as television and radio manufacturers and other related firms

- Teaching positions for electronics, computer science and telecommunications related courses.

The Curriculum

Total credit hours of the curriculum are 140 and the credit distributions are described below:

a. General Requirements	24C
b. Core Courses	98C
c. Elective Courses	5C
d. Project Work/Industrial Training	03C
	140C

Bachelor of Science (B.Sc.) in Information & Communications Engineering

Minimum Requirement 140 Credits

a. General Requirements (24C)

(i) Compulsory General Education Courses (15C)

BUS 101	Introduction to Business	3
ENG 100	Spoken English	3
ENG 101	Basic English	3
ENG 102	Composition & Communication Skills	3
GEN 201	Bangladesh Studies	3

(ii) Optional General Education Courses (9C)
Choose any THREE courses (OPT 001- OPT 003) from

GEN 202	Eastern Culture & Heritage	3
GEN 203	Ecological System & Environment	3
GEN 204	Western Thought	3
GEN 205	Introduction to Psychology	3
GEN 206	Introduction to Sociology	3
GEN 207	Industrial Psychology	3
GEN 208	Introduction to Philosophy	3
GEN 209	Social Psychology	3
GEN 210	International Relations	3
GEN 211	Concepts of Journalism & Media Studies	3

b. Core Courses (98C)

ICE 105	Computer Fundamentals & Programming Language	4
ICE 107	Object Oriented Programming with C++	4
ICE 206	Discrete Mathematics & Numerical Methods	3
ICE 208	Data Structure& Algorithm	4
ICE 211	Electrical Circuits & Networks	4
ICE 212	Basic Electronics & Devices	4
ICE 214	Electronic Circuits	4
ICE 301	Database Management Systems	4
ICE 302	Computer Communications & Networking	4
ICE 303	Signals & Systems	4
ICE 310	Electromagnetic Theory	3
ICE 311	Digital Electronic Circuits	4
ICE 312	Analog Communications	3
ICE 314	Digital Communications	4
ICE 320	RF & Microwave Engineering	4
ICE 325	Computer Organization & Operating Systems	3
ICE 327	Network Programming with JAVA	4
ICE 412	Wireless & Mobile Communications	4
ICE 416	Microprocessors & Interfacing	4
ICE 423	Telecommunications Networks & Switching	3
MAT 101	Differential & Integral Calculus	3
MAT 102	Differential Equations & Special Functions	3
MAT 201	Linear Algebra	3
MAT 301	Complex Variables & Mathematical Transforms	3
PHY 101	Physics I (Mechanics, Waves & Thermodynamics)	4
PHY 102	Physics II (Electricity, Magnetism & Physical Optics)	4
STA 102	Statistics & Probability	3

c. Elective Courses (15C)

(i) ICE or other Engineering Courses
Choose any FOUR courses (ECT 001 - ECT 004) from (12C)

ICE 402	Web Page Development & Management	3
ICE 403	System Analysis & Design	3
ICE 404	Software Engineering	3
ICE 405	Communications Languages & Software	3
ICE 406	Telecommunications Hardware/ Software Interface	3
ICE 410	Optoelectronics & Photonics	3
ICE 411	Digital Signal Processing	3
ICE 414	Optical Communications	3
ICE 415	Satellite Communications	3
ICE 417	Artificial Intelligence & Expert Systems	3
ICE 419	Digital Image Processing	3
ICE 421	Error Control Coding	3
ICE 424	VLSI Engineering	3
ICE 425	VLSI for Telecommunications	3
ICE 426	Neural Networks & Applications	3
ICE 427	Computer Graphics & Visualizations	3
ICE 428	Robotic Technology	3
ICE 430	Communications & Network Security	3
ICE 431	Broadband Networks	3
ICE 432	Multimedia Communications Technology	3
ICE 435	Antenna Engineering	3

(ii) Courses from non-Engineering Subjects
Choose any ONE course (ECT 005) from (3C)

ACT 101	Financial Accounting	3
ECO 101	Principles of Microeconomics	3
ECO 102	Introduction to Macroeconomics	3
FIN 101	Principles of Finance	3
MGT 101	Principles of Management	3
MKT 101	Principles of Marketing	3

d. Project Work/Industrial Training 3C
Choose any ONE course from

ICE 498	Project Work	3
ICE 499	Industrial Training	3

Department of Computer Science and Engineering

Department of Computer Science and Engineering at EWU, since its inception, has been offering the undergraduate program in Computer Science and later introduced Computer Science and Engineering with more focus on the ICT industry worldwide. Computer Science and Engineering (CSE) delivers the fundamental skills needed to become a Computer Scientist. It is the aim of the B.Sc. in Computer Science and Engineering to give you a wide knowledge of the subject, rather than just an understanding of existing commercial approaches, so that the student's understanding and knowledge can adapt and evolve to match the skills that will be required in the coming century. The degree is designed for a wide range of students, including those who wish to pursue a career in software engineering or computer programming, based on strong technical competence in software system design and interfacing, and also those who wish to move on to study for higher degrees in the computing and information technology area.

The primary objectives of the curriculum are to ensure that every graduate is thoroughly familiar with the fundamental principles of modern computer science and computing systems in general; to show understands how these principles relate to software, hardware and systems design; and is to make students familiar with at least one significant area of applications of computers. Other major objectives include familiarize them providing graduates with the ability to comprehend a variety of problem-solving algorithms; familiarity with several programming languages for implementing these algorithms; promote understanding of hardware and/or software systems; give students the ability to make informed choices of software and hardware for a variety of problems; and provide an understanding of the role that human factors play in implementing computer-based systems.

The B.Sc. in CSE is designed to equip graduates with the knowledge and skills required by the ICT industry. Special emphasis is given on systems design and architecture. Students gain industry knowledge throughout their stay in the CSE program. The CSE department has strong inclination towards research and development and every semester students participate as co-authors with faculty members in publication of journal papers of international standard. The CSE department hosts on regular basis seminars and talks on research areas in order to create interest among students and to prepare them for joint research initiatives in the future.

Program Objectives

A graduate of the Computer Science and Engineering Program will be able to:

- Demonstrate competence by creating a variety of problem-solving algorithms for moderately complex problems;

- Demonstrate competence by implementing algorithms in at least two modern programming languages;

- Explain the software development process and the software life cycle and demonstrate competence in the use of procedures and common tools for software development maintenance;

- Explain the organization of the computer science discipline and be able to demonstrate proficiency in at least one area of specialization (computer applications, computer systems or software engineering or Logic Design);

- Explain the organization of the hardware and software subsystems that comprise modern computing systems and provide analysis of how system organization impacts on the selection of algorithms and programming languages;

- Point to significant personal experiences as a member of a team developing substantial non-academic computer-related projects.

Final Year Project

The CSC499 / CSE499 Course Project is the core element of the undergraduate studies programme. It consists of studies and research on a topic derived from the student's field of interest. The project is chosen in the final year of the study.

Research for the project work will be carried out during a student's final year of study and will be based on the identification of appropriate sources and methods. The project individual/group will come up with a report on the project work to be presented before the project assessors on the scheduled project defense date.

The course project draws together knowledge acquired in different areas of the programmes as well as utilizing skills developed during a student's stay the department.

Selection of Topic and Preparation

In the course of the study, a student needs to give careful thought to identifying the area of interest. This not only drives students towards the right selection of topic for the project but at the same time enable them to gain understanding on the inner facts of the problem that s/he may address in the project work. Research seminars and workshops help student to identify an area of research activity and guide them on the formulation of the problem area.

Working on the Project

In the course of their project work, students should be able to devote a large amount of time to the progress of the work. Students will require frequent discussions with project advisor to prepare the background during the early stage of the project.

Presentation and Submission

Supervision and Feedback
During consultation with the supervisor, student should discuss outstanding problems and questions of revision, style and presentation. S/he should ask the supervisor to read and to comment upon a draft version of the project and on the outline of the project presentation for the defense.

Final Version of the Project

The final version of the project work should be completed incorporating ideas acquired during the discussion and during draft revision of the work with the supervisor.

Length and Format

The department provides necessary guideline on the format of the project report along with other important deadlines.

A Computer Lab Class in Progress

Bachelor of Science (B.Sc.) in Computer Science
Minimum Requirement 130 Credits

Course	Title	Credit
General Requirements:		**21**
Compulsory General Education Courses		**15**
BUS 101	Introduction to Business	3
ENG 100	Spoken English	3
ENG 101	Basic English	3
ENG 102	Composition and Communication Skills	3
GEN 201	Bangladesh Studies	3

Course	Title	Credit
MAT 101	Calculus I	3
MAT 102	Calculus II	3
MAT 104	Co-ordinate Geometry and Vector Analysis	3
MAT 201	Linear Algebra	3
STA 102	Statistics and Probability	3
PHY 101	Physics I	4
PHY 102	Physics II	4

	Title	Credit
Optional General Education Courses		**6**
Choose two courses from		
GEN 202	Eastern Culture and Heritage	3
GEN 203	Ecological System and Environment	3
GEN 204	Western Thought	3
GEN 205	Introduction to Psychology	3
GEN 206	Introduction to Sociology	3
GEN 207	Industrial Psychology	3
GEN 208	Introduction to Philosophy	3
GEN 209	Social Psychology	3
GEN 210	International Relations	3
GEN 2XX	Any Other General Courses	3

	Title	Credit
Core Requirements		**91**
CSE 105	Structured Programming	4
CSE 107	Object Oriented Programming	4
CSE 205	Discrete Mathematics	3
CSE 207	Data Structure	4
CSE 225	Numerical Methods	3
CSE 245	Algorithms	4
EEE 252	Basic Electronics	4
CSE 255	Digital Logic Design	4
CSE 275	Operating Systems	3
CSE 301	Database Systems	4
CSE 350	Data Communications	3
CSE 360	Computer Architecture	3
CSE 405	Computer Networks	3
CSE 409	Systems Programming	3
CSE 410	Artificial Intelligence	3
CSE 411	Software Engineering	3
CSE 412	Programming with JAVA	4
CSE 420	Computer Graphics	3
CSE 430	Compiler Design	3
CSE 498	Social and Professional Issues in Computing	3

	Title	Credit
Elective Courses		**15**
(a) From Computer Science Courses		
Choose Three Courses from		**9**
CSE 401	Information System Analysis and Design	3
CSE 413	Automata Theory and Theory of Computations	3
CSE 415	Software Development Project	3
CSE 422	Simulation and Modeling	3
CSE 444	Fault Tolerant Computing	3
CSE 452	Distributed Systems and Algorithms	3
CSE 460	Programming Language Principles	3
CSE 464	Advanced Database System	3
CSE 470	Expert System	3
CSE 474	Pattern Recognition	3
CSE 476	Neural Networks	3
CSE 478	Stochastic Processes	3
CSE 480	Web Database Programming	3
CSE 482	Parallel Computation	3
CSE 484	Computational Geometry	3

	Title	Credit
From Non Computer Science/Engineering Courses:		**6**
(b) Choose Two courses from		
ACT 101	Financial Accounting	3
ECO 101	Principles of Microeconomics	3
ECO 102	Introduction to Macroeconomics	3
FIN 101	Principles of Finance	3
MGT 101	Principles of Management	3
MGT 337	Production Operations Management	3
MIS 101	Introduction to Management Information System	3
MKT 101	Principles of Marketing	3
MKT 201	Marketing Management	3

	Title	Credit
Internship/Project		**3**
CSC 499	Internship/Project	3

Bachelor of Science (B.Sc.) in Computer Science and Engineering

Minimum Requirement 143 Credits

Course	Title	Credit
General Requirements		**21**
Compulsory General Education Courses		**15**
BUS 101	Introduction to Business	3
ENG 100	Spoken English	3
ENG 101	Basic English	3
ENG 102	Composition and Communication Skills	3
GEN 201	Bangladesh Studies	3
Optional General Education Courses		**6**
Choose two courses from		
GEN 202	Eastern Culture and Heritage	3
GEN 203	Ecological System and Environment	3
GEN 204	Western Thought	3
GEN 205	Introduction to Psychology	3
GEN 206	Introduction to Sociology	3
GEN 207	Industrial Psychology	3
GEN 208	Introduction to Philosophy	3
GEN 209	Social Psychology	3
GEN 210	International Relations	3
GEN 2XX	Any Other General Courses	3
Core Requirements		**104**
CSE 105	Structured Programming	4
CSE 107	Object Oriented Programming	4
EEE 109	Electrical Circuits	4
CSE 205	Discrete Mathematics	3
CSE 207	Data Structure	4
CSE 225	Numerical Methods	3
CSE 245	Algorithms	4
EEE 251	Electronic Devices and Circuits	4
CSE 255	Digital Logic Design	4
CSE 275	Operating Systems	3
CSE 301	Database Systems	4
CSE 350	Data Communications	3
CSE 360	Computer Architecture	3
EEE 204	Electrical Measurement and Instrumentation	4
EEE 380	Digital Electronics	4
CSE 405	Computer Networks	3
CSE 410	Artificial Intelligence	3
CSE 411	Software Engineering	3
CSE 412	Programming with JAVA	4
CSE 430	Compiler Design	3
CSE 442	Microprocessors and Microcomputers	4
CSE 498	Social and Professional Issues in Computing	3
MAT 101	Calculus I	3
MAT 102	Calculus II	3
MAT 104	Co-ordinate Geometry and Vector Analysis	3

Course	Title	Credit
MAT 201	Linear Algebra	3
MAT 301	Mathematics for Engineers	3
STA 102	Statistics and Probability	3
PHY 101	Physics I	4
PHY 102	Physics II	4
Elective Courses		**15**
From Computer Science/Engineering Courses		**9**
Choose three courses from		
CSE 401	Information System Analysis and Design	3
CSE 409	Systems Programming	3
CSE 413	Automata Theory and Theory of Computations	3
CSE 415	Software Development Project	3
CSE 420	Computer Graphics	3
CSE 422	Simulation and Modeling	3
EEE 452	Electrical Technology	3
CSE 432	Digital Signal Processing	3
CSE 434	Digital Image Processing	3
CSE 436	Advanced Computer Architecture	3
CSE 438	Digital Computer Design	3
CSE 444	Fault Tolerant Computing:	3
CSE 452	Distributed Systems and Algorithms	3
CSE 470	Expert Systems	3
CSE 474	Pattern Recognition	3
CSE 476	Neural Networks	3
CSE 478	Stochastic Processes	3
CSE 480	Web Database Programming	3
CSE 482	Parallel Computation	3
CSE 484	Computational Geometry	3
EEE 490	VLSI Design	3
CSE 492	Robotics	3
From Non Computer Science/Engineering Courses		**6**
Choose two courses from		
ACT 101	Financial Accounting	3
ECO 101	Principles of Microeconomics	
ECO 102	Introduction to Macroeconomics	3
FIN 101	Principles of Finance	3
MGT 101	Principles of Management	3
MGT 337	Production Operations Management	3
MIS 101	Introduction to Management Information System	3
MKT 101	Principles of Marketing	3
MKT 201	Marketing Management	3
Internship/Project		**3**
CSE 499	Internship/Project	3

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Department of Electrical and Electronic Engineering (EEE)

The involvement of electrical and electronic technologies in modern mundane civilization is inextricable. All aspects of this engineering branch play vital roles in ameliorating the quality of living. The electrical and electronic engineering is therefore recognized as one of the most important disciplines of engineering. This is actually an applied science that combines the applications of physics, chemistry and mathematics. Due to the dependency of other fields of science and technology on it, the Electrical and Electronic Engineering education is directed towards the development of solid foundations of the students that will enable them to endeavor almost all the important branches of modern science. Hence the opportunity and aspiration of electrical and electronic engineering is virtually unlimited.

The Department of Electrical and Electronic Engineering (EEE) at East West University is offering B. Sc. in Electrical and Electronic Engineering with an ambition to develop competent personals in this field. The degree is designed to prepare its graduates to contribute in all important fields of electrical engineering, namely solid state electronics, telecommunication, computer hardware, control and automation, power etc. The curriculum involves primarily the study of a number of core courses of electrical engineering, along with some courses from specialized areas. To ensure a comprehensive grasp on the theories of electrical and electronic engineering, a number of courses on mathematics, physics and chemistry have been included in the curriculum. Although, due to its extensive application, Computer Science and Engineering has emerged as a different branch, a profound knowledge of both computer hardware and software is mandatory for electrical and electronic engineering graduates. So the syllabus includes a number of programming and other computer related courses.

Program Objectives/Highlights of the Program

The principal objectives/highlights of the program are as follows:

- To provide the students with solid foundation of mathematics and mathematical tools to pursue both undergraduate and graduate study in electrical and electronic engineering.

- To provide understanding of electrical and electronic circuits, solid state electronics, electrical properties of materials and electromagnetic theory.

- To introduce the students to signal processing and communication engineering.

- To enable the students understand power generation, conversion and distribution processes.

- To equip the students with profound knowledge on computer programming, interfacing and microprocessor based systems.

Admission Test in Progress

B.Sc. in Electrical & Electronic Engineering
Minimum Requirement 146 Credits

The credit distribution is given below:

A.	General Education Requirement	27C
B.	Core Requirement	101C
C.	Elective Requirement	15- 20C
D.	Project/Industrial Training	03C
	Total	**146-151C**

A. General Requirements — 27 Credits

(i) Compulsory General Education Courses — 15

BUS 101	Introduction to Business	3
ENG 100	Spoken English	3
ENG 101	Basic English	3
ENG 102	Composition & Communication Skills	3
GEN 201	Bangladesh Studies	3

(ii) Optional General Education Courses — 6 Credits
Choose two courses from

GEN 202	Eastern Culture & Heritage	3
GEN 203	Ecological System & Environment	3
GEN 204	Western Thought	3
GEN 205	Introduction to Psychology	3
GEN 206	Introduction to Sociology	3
GEN 207	Industrial Psychology	3
GEN 208	Introduction to Philosophy	3
GEN 209	Social Psychology	3
GEN 210	International Relations	3
GEN 211	Concepts of Journalism & Media Studies	3
GEN 212	Women in Development	3
GEN 2XX	Any Other General Courses	3

(iii) Optional Courses from non Engineering Subjects — 6 Credits
Choose two courses

B. Core Courses — 101 Credits

EEE 101	Electrical Circuits I	3+1=4
EEE 102	Electronic Circuits I	3+1=4
CSE 105	Structured Programming	3+1=4
EEE 200	Electrical Designs and Drafting	0+1=1
EEE 201	Electrical Circuits II	3+1=4
EEE 202	Electronic Circuits II	3+1=4
EEE 203	Numerical Analysis for Electrical Engineering	3+0=3
EEE 204	Electrical Measurements and Instrumentation	3+1=4
EEE 300	Electronics Shop	0+1=1
EEE 301	Electrical Machines I	3+0=3
EEE 302	Digital Logic Design	3+1=4
EEE 303	Signals and Systems	3+0=3
EEE 304	Electrical Machines II	3+1=4
EEE 305	Electromagnetic Fields and Waves	3+0=3
EEE 306	Power System Engineering	3+1=4
EEE 307	Telecommunications Engineering	3+1=4
EEE 308	Electronic Properties of Materials	3+0=3
EEE 309	Digital Signal Processing	3+0=3
EEE 401	Microprocessor and Interfacing	3+1=4
EEE 402	Introduction to Control Systems	3+1=4
EEE 403	Semiconductor Devices	3+0=3
CHE 101	Introduction to Chemistry	3+1=4
MAT 101	Differential and Integral Calculus	3+0=3
MAT 102	Differential Equations and Special Functions	3+0=3
MAT 104	Co-ordinate Geometry and Vector Analysis	3+0=3
MAT 201	Linear Algebra	3+0=3
MAT 301	Complex Variables and Mathematical Transforms	3+0=3
PHY 101	Physics I (Mechanics, Waves & Thermodynamics)	3+1=4
PHY 102	Physics II (Electricity, Magnetism & Physical Optics)	3+1=4
STA 102	Statistics and Probability	3+0=3

C. Elective Courses

Choose FIVE courses (ELTV1 - ELTV5) taking three courses from any of the first four groups (GROUP A - GROUP D) and two courses from any other groups except the preferred one.   **15-20 Credits**

GROUP A (Microelectronics)

EEE 411	Quantum Phenomena in Nanostructures	3+0=3
EEE 412	Theory of Semiconductor Devices	3+0=3
EEE 413	Nanoscale Electronic Devices	3+1=4
EEE 414	Optoelectronics	3+1=4
EEE 415	Semiconductor Processing and Fabrication	3+0=3
EEE 416	VLSI Circuits & Systems	3+1=4
EEE 417	Power Electronics	3+1=4
EEE 418	Analog Integrated Circuits	3+1=4
EEE 419	Biomedical Electronics	3+0=3

GROUP B (Communications Engineering & Signal Processing)

EEE 421	RF & Microwave Engineering	3+1=4
EEE 422	Digital Communications	3+1=4
EEE 423	Wireless & Mobile Communications	3+1=4
EEE 424	Fiber Optics	3+1=4
EEE 425	Digital Image Processing	3+0=3

GROUP C (Computer Engineering)

EEE 431	Advanced Logic Design	3+0=3
EEE 432	Microprocessor Based System Design	3+1=4
EEE 433	Computer Networks	3+1=4
CSE 361	Computer Architecture	3+1=4
CSE 435	Multimedia System Design	3+0=3
CSE 450	Data Structure and Algorithm	3+1=4

GROUP D (Power Engineering)

EEE 441	Power Station	3+0=3
EEE 442	Switchgear & Protective Relays	3+1=4
EEE 443	Special Machines	3+0=3
EEE 444	High Voltage Engineering	3+1=4
EEE 445	Renewable Energy	3+0=3
EEE 446	Power Systems Operation & Reliability	3+0=3

GROUP E (Interdisciplinary)
Any non Engineering courses not less than 300 level.

D. Project Work/Industrial Training — 3 Credits

Choose any ONE course from

EEE 498	Project Work	3
EEE 499	Industrial Training	3

Flow-Chart for Courses to be followed during the FOUR YEARS of the Undergraduate Program of EEE				
SEMESTER	YEAR I	YEAR II	YEAR III	YEAR IV
SEM I	ENG 100	GEN201	ONEC-I	EEE 401
	BUS101	EEE 201	EEE 300	EEE 402
	EEE 101	STA 102	EEE 301	EEE 403
	MAT 101	MAT 102	EEE 302	
SEM II	ENG101	OGEC-I	ONEC-II	ELTV I
	PHY 101	MAT 201	EEE 303	ELTV II
	CHE 101	EEE 200	EEE 304	ELTV III
	CSE 105	EEE 202	EEE 305	
SEM III	ENG102	OGEC-II	EEE 306	ELTV IV
	EEE 102	MAT 301	EEE 307	ELTV V
	MAT 104	EEE 203	EEE 308	EEE 498/EEE 499
	PHY 102	EEE 204	EEE 309	

Legends

OGEC : Optional General Education Courses (any two from GEN 202 to GEN 212).
ONEC : Optional Courses from non-Engineering courses.
ELTV : Elective Courses.

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Electronics & Instrumentation, Nuclear Engineering
Kyushu University, Japan

Students in the Digital Systems Lab

Department of Pharmacy

Introduction

The global demand of Pharmacy graduates in the academic and research institutions, pharmaceutical industries, hospitals and other health related fields is increasing in rapid pace at both home and abroad. Throughout history Pharmacy has successfully adapted to the changes within the pharmaceutical industry and medicine.

The introduction of biotechnology based pharmaceutical products has introduced various newer dimensions in the continuous advancing field of pharmaceutical sciences.

The biotechnology revolution has presented Pharmacy with a unique challenge and pharmacists must continue to fulfill their existing responsibilities while developing additional roles. The pharmacists are the key persons to promote sound scientific judgement and selecting new therapeutic agents for formulary inclusions.

The science of Pharmacy integrates the knowledge of various disciplines such as chemistry, human physiology, anatomy, pharmacology, microbiology, pharmaceutics, pharmaceutical technology, mathematics, statistics , economics, marketing , management etc.

Mission and Future Prospect

The rapid expansion in the field of biotechnology products has presented a new set of opportunities for pharmacists so that they develop newer skills and expand their roles in clinical pharmacy services, clinical research, drug distribution and drug information. However to retain the responsibility for dispensing of new therapeutic aspects pharmacists must keep a breast of innovation of all areas of pharmaceutical sciences including the development of new drug delivery systems and expanding contemporary pharmacy services to fulfill the unique demands for pharmacists in societies at home and abroad and to cope with the unprecedented development in the field of medical and pharmaceutical sciences.In the pharmacy department of East West University we have developed new approaches to pharmacy education and created an environment for innovative basic and fundamental research

Direction

The aim for the introduction of the Pharmacy program is to equip the students with proper scientific informations and knowledge leading to the innovation, formulation, preparation, quality assurance, distribution and management of drugs. It is also designed to produce the skilled and efficient manpower to manage pharmaceutical industries, retail pharmacy, hospital pharmacy , community pharmacy services and other govt bodies related to health services and research organizations.

Status

The Bachelor of Pharmacy in the East West University is a four year program divided into 12 semesters (3 semester per year) required to complete 148 credits.The curriculum is designed to ensure that the students are provided with both theoretical practical knowledge for entrusting successful career as a pharmacist. The University is taking necessary preparations to introduce the evening Master in Pharmaceutical Technology (M.S Pharm Tech) program this year in the Spring 2006.

Research

Innovative research program in the field of pharmaceutical sciences, in collaboration with the department of Pharmaceutical Technology, University of Dhaka, Birdem, ICDDRB is in progress. Correspondence with Alabama University, USA and University of Ulster is going on for joint research program.

The demand for pharmacy graduates continues both within pharmaceutical industries and academic/research institutions nationwide and abroad. Advances in pharmaceutical sciences have been occurring at a very rapid pace due to the latest developments in genetic engineering. This new scientific activity has greatly increased the number of research positions available to pharmacy graduates in the biotechnology industry.

Pharmaceutical Science is a subject that integrates knowledge of biochemistry, cell and molecular biology, physiology and chemistry to enable the study of the relationship between biological processes and therapeutic agents. Pharmacists investigate the effects and mechanism of reaction of drugs and chemical agents with living organisms. The areas of pharmacy are many and diverse, and include the therapeutic and toxicological actions of drugs on humans, animals and microorganisms, the influence of chemicals upon the environment and biological ecosystems, and the use of drugs as research tools for the elucidation of molecular and biochemical mechanisms.

Program

The Bachelor of Pharmacy of the East West University is a four year program divided into 12 semesters (3 semesters per year) requiring completion of 148 credits. The program is designed to ensure that students are provided both theoretical and practical knowledge essential for a successful career in the future.

Laboratory

There are at least 15 laboratory courses and a research project to be carried out by undergraduate students of the Pharmacy Deaprtment. These require modern laboratory facilities. Current laboratory facilities include advance instruments like UV-Visible spectrophotometer, Thermocycler for PCR, ELISA, high resolution microscope, fundamental chromatographic instruments, necessary equipments for microbiological experiments, pharmaceutics and pharmacology. Separate laboratory arrangements are available for both faculty members and students for conducting research.

Admission Requirements

In addition to the minimum general admission criteria for EWU, students should have Physics, Chemistry and Mathematics at HSC or equivalent level and Biology at SSC and or HSC level to be admitted to B. Pharm. program.

The courses offered for the Bachelor of Pharmacy (B.PHARM) degree are listed on the next page.
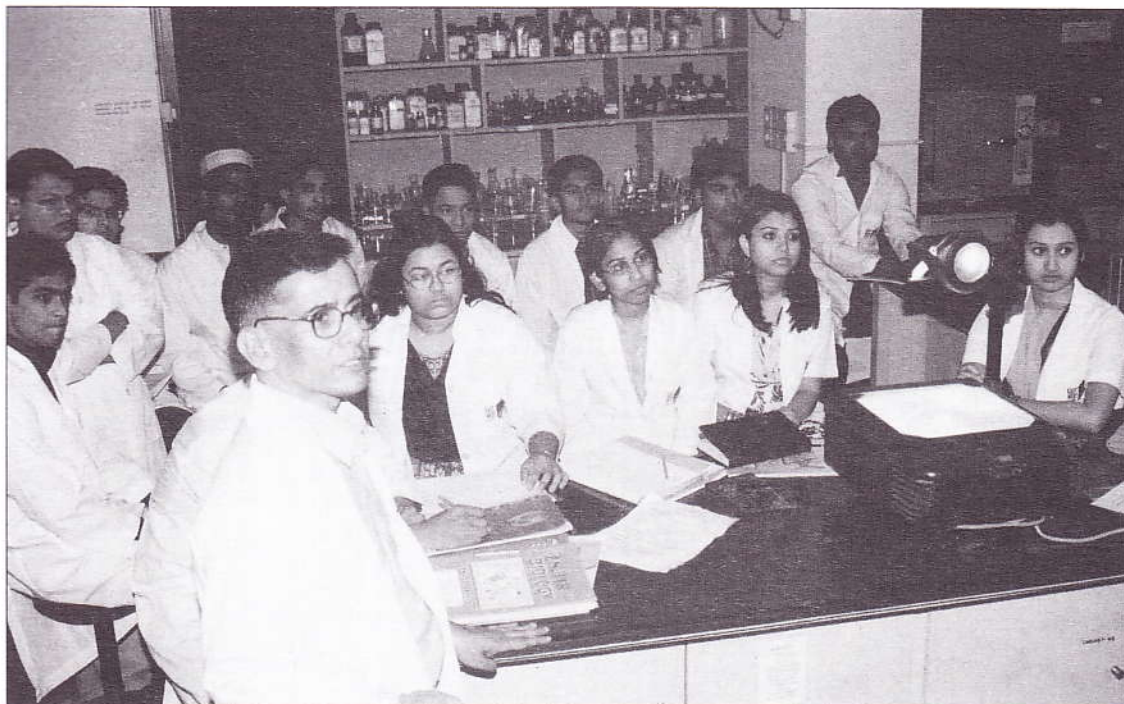
A Pharmacy Class in Progress

Bachelor of Pharmacy

Curriculum Summary
Minimum Requirement 148 Credits

First Year: 39 Credits

Course No. + Course Name	Credits	Prerequisite
BUS 101: Introduction to Business	3	None
CSE 101: Introduction to Computers	3	None
ENG 100: Spoken English	3	None
ENG 101: Basic English	3	ENG 099
ENG 102: Composition and Communication Skills	3	ENG 101
PHRM 101: Physical Pharmacy I	3	None
PHRM 102: Cell Biology and Anatomy	3	None
PHRM 103: Organic Pharmacy	2+1	None
MAT 100: College Mathematics	3	None
PHY 100: Introductory Physics	3	MAT 100
Any three general (GEN) courses 3 X 3 = (each of 3 credits) offered by EWU	9	

Second Year: 35 Credits

Course No. + Course Name	Credits	Prerequisite
GEN 201: Bangladesh Studies	3	ENG 102
PHRM 201: Human Physiology I	3+1	PHRM 102
PHRM 202: Microbiology	2+1	None
PHRM 203: Pharmaceutical Analysis I	2+1	None
PHRM 204: Physical Pharmacy II	2+1	PHRM 101
PHRM 205: Inorganic Pharmacy	3	PHRM 103
PHRM 206: Biochemistry	3+1	PHRM 103
PHRM 207: Pharmacognosy I	2+1	None
PHRM 208: Human Physiology II	2+1	PHRM 102, 201
PHRM 209: Statistics for Pharmaceutical Sciences	3	None
PHRM 210: Pharmaceutics I	2+1	None

Third Year: 37 Credits

Course No. + Course Name	Credits	Prerequisite
PHRM 301: Pharmacology I	3	PHRM 208
PHRM 302: Medicinal Chemistry I	3	PHRM 206
PHRM 303: Phamacognosy II	3+1	PHRM 207
PHRM 304: Medicinal Chemistry II	2+1	PHRM 302
PHRM 305: Pharmaceutical Microbiology	2+1	PHRM 202
PHRM 306: Pharmacology II	3+1	PHRM 301
PHRM 307: Industrial Pharmacy I	3	PHRM 210
PHRM 308: Pharmaceutics II	3+1	PHRM 210
PHRM 309: Pharmaceutical Analysis-II	3+1	PHRM 203
PHRM 310: Toxicology	3	PHRM 301
PHRM 311: Clinical & Hospital Pharmacy	3	PHRM 310

Fourth Year: 37 Credits

Course No. + Course Name	Credits	Prerequisite
PHRM 401: Pharmaceutical Management & Marketing	3	PHRM 307
PHRM 402: Industrial Pharmacy II	3+1	PHRM 307
PHRM 403: Drug Design & Development	3	PHRM 304
PHRM 404: Pharmaceutical Research	5	Minimum 60 credits completed Laboratory
PHRM 405: Pharmacy Quality Assurance	3	PHRM 307
PHRM 406: Biopharmaceutics & Pharmacokinetics	3	PHRM 308
PHRM 407: Pharmaceutical Biotechnology	3	PHRM 305
PHRM 408: Safety Health & Environment	3	PHRM 202 & PHRM 301
PHRM 409: Advanced Pharmaceutical Analysis & QC	3+1	PHRM 309
PHRM 410: Pharmacy Laws and Ethics	3	PHRM 405
PHRM 411: Cosmetology	2+1	PHRM 307

N.B: Not applicable for those who have done PHRM 205 & PHRM 206 courses.

Faculty Members of the Department

Professor

Mr. Syed Akhter Hossain
Ph.D, Applied Bio-Chemistry, Food and Nutrition
School of Agriculture, Sutton Bonington
University of Nottingham (UK)

Mr. Bidyut Kanti Datta
Ph.D, Pharmaceutical Technology
Jadavpur University, Calcutta, India

Assistant Professor

Ms. Sufia Islam
Ph.D, Pharmacology
University of Dhaka

Mr. JMA Hannan
PhD, Pharmacology
School of Biomedical Sciences, University of Ulster, UK

Senior Lecturer

Ms. Saquiba Yesmine
M. Pharm
Jahangirnagar University

Lecturer

Ms. Juthika Kundu
M.Pharm, Pharmaceutical Biotechnology
Birla Institute of Technology, India

Adjunct Faculty

Mr. Rezaul Jalil
Ph.D, Pharmaceutics
University of London

Mr. Tofail Ahmed Chowdhury
Ph.D, University of Dhaka

Mr. A S S Rouf
Ph.D, Organic Pharmaceutical Chemistry
Okayama University, Japan

Students in the Cafeteria

Undergraduate Studies

Admission

Prospective students should obtain an EWU Admission Form by paying in cash or by sending a bank draft of Taka 500 or US $10 to the Registrar's Office. They should return the completed application form to the Registrar's Office within the stipulated time. All correspondence and inquiries concerning admission to the university should be addressed to the Registrar's office.

Students seeking admission to EWU must qualify in the admission test. The date of the test is announced in major daily newspapers. Students are tested on English Language (structure, vocabulary, comprehension and composition) and Basic Mathematics. Those who want to study Computer Science and Engineering and Electrical and Electronic Engineering/Information and Communications Engineering are required to have competence in HSC-level Mathematics and those intending to study pharmacy are required to have competence in HSC or A level Chemistry and Mathematics, while others are required to have reasonable proficiency in SSC-level Program Mathematics. Those who seek admission in BA (English) program are exempted from the Math Test.

Results of the Admission test are announced within 3 days of the test. A list of successful candidates is posted on the Bulletin Board of the university.

Admission Requirements

Minimum qualifications for admission to undergraduate programs are as follows:

1. Minimum 2nd division or an average GPA of 2.50 in SSC and HSC with a minimum of 2.00 in each.

2. University of London GCE "O" level in four subjects with at least 8.0 points and "A" Level in two subjects with average GPA of 2.0. or

3. American High School Diploma and

4. Acceptable EWU Admission Test Score.

- Admission Test will be waived for candidates securing a minimum score of 1100 in the Scholastic Aptitude Test (SAT) and at least 550 in the Test of English as a Foreign Language (TOEFL).

Students who have completed a two-year Bachelor's degree from a recognized university can apply for admission into the four-year undergraduate program. However, EWU will consider applications for credit transfer only in cases where previous academic performance meets EWU degree requirements.

Application forms are available for Tk 500 at EWU Accounts Department, 43 Mohakhali, Dhaka 1212. Student can receive application forms by mail through writing to the office of the Registrar along with a bank draft or money order for Tk 500 in favor of East West University. However, it is preferable that the student/guardian collect application forms personally.

Learning Methodology

In order to produce graduates who can adapt their knowledge to changing circumstances, all the courses offered by different departments put great emphasis on applying concepts from classroom lectures and reading to solving problems.

The mode of education that East West University use has been called "analytical learning" and it stresses understanding and problem-solving rather than memorizing. In this mode, our responsibility is to provide experiences from which you can construct an understanding of the subject area. It is your responsibility to integrate the experiences into your mind, and to use the knowledge gained in different situations.

Lectures and Tutorials

Courses are organized to provide opportunities for students to learn the concepts and skills required in the field. Lectures are perhaps the most visible form of teaching. A course outline for each course is provided by faculty members in the first class of the semester to detail course content along with assessments guideline and text/reference books used for the course. It is important for the student to realize that lecture materials are not intended for memorizing, but for understanding. Learning through interactive participation is a major emphasis at East West University.

Tutorial classes are held regularly. These involve discussions between students and faculty members in areas that are challenging. Courses include assignments which can help students learn concepts and skills. Usually, an assignment will include some general topics as well as parts that are designed to challenge the better students.

Courses also include in-course projects, which can create an impact through infusion of skills and concepts to know from real-life problem solving. In most cases, during project work students interact directly in the problem domain and thereby gain experience.

Course Assessment

Different course instructors use different ways to determine how well each student has mastered the materials presented. Semester final examinations along with two midterm examinations (held according to the semester academic calendar) are common besides class quiz and assignments. The course information given by the faculty member at the first class of the semester illustrates the assessment strategy for respective course. All in-course assessment results are posted on the notice board.

Student Ethics

East West University is committed to maintaining proper academic environment in its premises. Students are expected, as enlightened members of the society, to be of good moral character. They should observe the general rules of discipline, honesty, punctuality and show respect for the rights of others. Willful violation of these general rules seriously disturbs the academic environment and undermines the efforts of the university to impart high quality education.

The university views academic misconduct such as plagiarism, candidate substitution or the use and possession of unauthorized material as a grave breach of discipline.

A. Academic Misconduct

i) Cheating at the examination by any method or means.
ii) Helping other students to cheat in examinations.
iii) Reproducing the work of others as one's own work.
iv) Fabrication or the falsification of any information with the intent to deceive.
v) Forgery, alteration, or misuse of university documents, records and identity cards.

B. Social Misconduct

i) Abusive or disorderly conduct.
ii) Sexual harassment.
iii) Physical assault in any form.
iv) Direct and indirect threat of violence.
v) Verbal, mental, and physical harassment.
vi) Participation in any activity that may disrupt any function of the university

C. Property Damage

i) Willful damage or destruction of university property.

D. Dangers to Health and Safety

i) Smoking inside university buildings.
ii) Possession or use of alcoholic drinks and drugs.
iii) Possession of sharp weapons and firearms.

E. Disobedience to Lawful Authority

i) Disobedience, interference, resistance or failure to comply with the direction of an authorized university personnel on duty.
ii) Unauthorized entry.

F. Theft

i) Theft or misappropriation of university funds and materials.
ii) Possession of stolen university property.

G. Penalties

The following are some of the penalties and sanctions that may be imposed on a student for violating the code of conduct of the university.
i) Warning in the form of written or verbal notice.
ii) Cancellation of the examination and/or an assignment.
iii) Expulsion for one or more semesters.
iv) Expulsion from the university.

H. Disciplinary Procedure

A Discipline Committee of the university examines the allegations of misconduct, takes evidence from both sides, and recommends penalties to be imposed on the student found guilty.

Academic Discipline

Any act of indiscipline, offence, or grievance committed by a student may be reported to the Proctor of EWU in writing by a student or staff/faculty for necessary action.

A Discipline Committee will act independently to ascertain facts and submit a report of the findings with recommendations for necessary action.

All students will receive photo identification cards with a student number. Students must display their ID cards when on campus. This is required for their own safety and the protection of the campus from unauthorized visitors. These cards will be used for various purposes such as entering campus, attending classes, using the library, and in accessing computers in computer labs.

Change of Degree Programs

A student who wishes to change his/her major discipline of study must appear in the Admission Test and qualify for the department to which s/he wants to study. For appearing in the subsequent admission test, the applicant must inform the Registrar.

Student Clubs

In addition to academic work, opportunities for other student activities abound. Students participate in different activities all year round. The university has a number of clubs to promote various extra-curricular activities. These include:

1. Environmental and Social Club
2. Business Club
3. Debating Club
4. Cine and Photography Club
5. MBA Club
6. Computer Club
7. Cultural Club
8. Sports Club
9. Rotaract Club of East West University
10. English Conversation Club
11. Pharmacy Club
12. Natural Science Club
13. EWU Electronics Club
14. Programmers Club
15. The English Poetry and Drama Club

Career and Employment

The Career Counseling Center provides proper guidance to students about their career plans. The center liaisons with prospective employers and arranges internships and part-time jobs for students and graduates.

The Career Counseling Center works to place students with leading business organizations of the nation who can expand their activities by utilizing fresh mind imbued with modern skills and expertise. As a forerunner among private universities in Bangladesh it is the center that endeavors not only to ensure excellence in education but also to help students find suitable careers. The center organizes job fair, workshops and seminars on regular basis for both career-seeking individuals, participating companies and potential bodies who are employers to make them interact of and to get to know each other's needs and priorities. Besides, the largest job portal in Bangladesh, BDJobs.com, has established a linkage with Career Counseling Center to extend job services to East West graduates.

Academic Advisory System

To provide an environment of continuous academic advisory support to student who requires it, especially with respect to adapting into the EWU academic programme, selecting a programme of study, and determining the suitability of subject to be registered,

(1) Each student is assigned an Advisor at the beginning of the academic year who assists the student in defining educational goals to be reached; gives information regarding curricula, and graduate programs; and discusses personal problems the student may have, especially those related to the student's academic progress and plans for subsequent pursuits. Students are expected to

schedule appointments with their advisors during pre-registration and at other times throughout the semester as needed.

(2) It is the responsibility of the Advisor to provide advisory support that ensure that the student will adapt well into his/her course of study and get the necessary advice with respect to programme of studies and other matters associated to it

Students must inform their advisors of any special needs or deficiencies, which might affect their academic performance, or selection of courses. Students are expected to know academic policies, procedures, and degree requirements, and must remain informed about their progress in meeting these requirements.

Students are encouraged to seek assistance as needed from advisors and take advantage of student support services provided by the university.

Virtual Campus

In line with EWU's mission for "excellence in education" to provide world class education using IT and Multimedia Technologies, all the courses offered at different departments are on-line. An online course page allows the student access vital information about the course including: the course information, exam deadlines, lecture plan, lectures notes, model questions, link to relevant web sites etc.

Students are required to familiarize themselves with how to access subject web pages and use different features provided by the Virtual Campus link on the web site of the university at www.ewubd.edu. Besides, students are also required to check for make-up and extra classes on-line.

Attendance Requirement

For students to complete their studies successfully, it will be necessary to attend reasonable portion (not less than 80%) of the lectures, tutorials and practical classes for the respective course and to carry out the necessary reading, preparation and assignments set.

Non-Degree Students

Applicants who are currently enrolled in an undergraduate program in a recognized university may apply for admission at EWU as non-degree students. Non-degree students may obtain transcripts reflecting credits and grades for the course(s) attended.

Tuition and Other Fees

The current fee structure is as follows:

1. Admission Fee (one-time & non refundable) Tk. 11,000

2. Course Fee Tk. 2,000 per credit hour for English & Economics courses and Tk. 2,600 for all other courses

3. Laboratory Fee: Tk. 1,000 per semester for CSC, CSE and EEE/ICE and Tk. 500 per semester for other departments.
4. Student Activity Fee Tk. 500 per semester

Total estimated fees for graduation will be as follows:

Items	BBA		B.Sc.			B.PHARM.	Liberal Arts	Social Science
		CSC	CSE	ICE	EEE		English	Economics
Credits	123	130	143	140	146-151	148	123	123
Admission Fee	11,000	11,000	11,000	11,000	11,000	11,000	11,000	11,000
Course Fee	3,10,800	3,32,600	3,66,400	3,58,600	3,74,200-3,87,200	3,67,800	2,60,400	2,60,400
Lab Fee	6,000	12,000	12,000	12,000	12,000	6,000	6,000	6,000
Activity Fee	6,000	6,000	6,000	6,000	6,000	6,000	6,000	6,000
Total	3,33,800	3,61,600	3,95,400	3,87,600	4,03,200-4,16,200	3,90,800	2,83,400	2,83,400

The university also offers remedial (non-credit) courses in English and Mathematics, for which a fee of Tk 2500 for each is charged for one semester only. Remedial Courses may be required for students on the basis of their score in the English and Mathematics part of the Admission Test. Passing these remedial courses is a prerequisite for continuing as a student. Remedial Biology is offered in Pharmacy Department with the same fee structure. If a student fails in the remedial courses in the first attempt, he/she will have to pay regular course fees of Tk. 7800 for these courses during subsequent registration.

Students must pay semester fees in full on the day of registration. A late registration fee of Tk. 500.00 is charged to students who register or pay their fees after the regular registration period. Approval to defer payment does not, however, reduce a student's obligation to pay tuition and fees. All dues are expected to be paid before the final examination.

A fee of Tk. 500.00 is charged for the official transcript.

Students in the Physics Lab

Facilities & Amenities

VSAT and Computing Facility

East West University provides an unique opportunity to meet the computational demand of an ever-increasing technology savvy society. The campus wide fiber optic network of over 300 workstations with servers of different brand helps students acquire skills for the worldwide IT industry. Faculty members have been keeping up with the demand of the technology.

The Network Infrastructure of the university is equipped with VSAT, AsiaSat 4, 2.4m Antenna C-Band, 2W ODU, BUC, LNB, FeedHorn, Reflector and LinkStar IDU (Built-in Router). The SunFire V100 with Solaris 8 OS for DNS, HP NetServer E-60 with Slackware OS for WWW, Proxy, & Mail Server, HP NetServer E-60 with WinNT OS for UMIS Server are the heart of the campus network and automation. One ALCATEL OmniStack 8008 GIGABIT Switch for Fiber Optic Backbone, four ALCATEL OmniStack 6124 Managed Switches for LAN, 48 Port Patch Panels and LIU with wall mount rack have shaped the fiber optic backbone of the EWU campus network.

Lab Facilities of East West University

1. **Internet Facilities and Information and Communication Services**

   East West University provides a unique opportunity for the computational demand of the ever-increasing technology savvy society. East West University has its own VSAT. The campus wide fiber optic network with servers of different brand helps students to acquire skills on the IT industry worldwide. The faculty members are keeping up with the technology and extend IT services to the nation. The campus is equipped with more than 300 computers. Both the servers and workstations are connected to the central networking infrastructure for the usage of the students, faculty members, admin officers and top executives. The computational facility for the students also includes:

   * Internet browsing and E-mail
   * CD archiving
   * Software Project development with SDC
   * On-line ACM Programming Competition

2. **Computer Labs**

   To support the hands on lab practices for different computation intensive courses, East West University has established five Computer Labs equipped with more than 200 computers and printers of various ranges. The operating systems supports are Windows, Linux, Solaries, etc. The programming languages and packages support include C/C++, Java, Fortran, Oracle, MatLab, Visual BASIC, SPSS, MS-SQL Server, MySQL, PHP, etc.

   All the computer labs are interconnected through switched network with fiber-optic campus backbone.

3. **Network Lab**

   To provide hands on practices on computer networking for the CSC/CSE/EEE/ICE/MIS students, a network lab has been established, which houses several computers, switches, routers, and networking kits.

4. **VLSI Lab**

   To train the CSE/EEE students in the area of high demanding VLSI design methods, a VLSI lab has been set up. The lab has full range of Cadence professional EDA tools for analog, digital, and mixed signal VLSI design. The lab also has tools and hardware devices for FPGA design.

5. **Digital Systems Lab**

   The university is equipped with modern digital systems laboratory. Digital Laboratory is housed with equipment ranging from Digital Storage Oscilloscope, Digital Trainer Boards, Micro-Controllers, Interfacing Adapters, and other supporting peripherals. Students are engaged in transforming ideas and creating computer interfaces like Digital Meter for three wheelers etc.

6. **Electronics Lab**

   The university established a state of the art electronics laboratory, which is equipped with various ranges of oscilloscopes, function generators, analog trainer boards, power supplies, signal generators, meters, etc.

7. Telecommunications Lab

The purpose of the Telecommunication Lab is primarily to offer a hands-on experience to students for training and research by providing a practical demonstration and exercise for the theory covered in Telecommunications courses. The Lab enables students to engage in telecom projects such as Analog Communications, Pulse Coded Modulation, Digital Communications, BER Calculation, Fiber Optics, CDMA , Transmit and Receiver Antenna, and Microwave Engineering. An important part of the Telecom Lab is the TIMS and MATLAB simulation tool, made by TIMS Technologies. The lab is also involved in research of Applications of computer networks, such as Wireless ad hoc sensor nets.

8. Physics Lab

The Physics laboratory is housed with modern instruments for everyday physics experiments. The dark room facility helps students to conduct optical experiments.

9. Electrical Machine Lab

An electrical machine lab for related EEE courses is in the process of establishment.

10. Control Engineering Lab

A control engineering lab for related EEE courses is in the process of establishment.

11. Pharmacy Laboratory

There are at least 15 laboratory courses and a research project to be carried out by undergraduate students of the Pharmacy Deaprtment. These require modern laboratory facilities. Current laboratory facilities include advance instruments like UV-Visible spectrophotometer, Thermocycler for PCR, ELISA, high resolution microscope, fundamental chromatographic instruments, necessary equipments for microbiological experiments, pharmaceutics and pharmacology. Separate laboratory arrangements are available for both faculty members and students for conducting research.

Modern Language Laboratory

The English Language Laboratory at East West University is used to expose students to different varieties of English, British, American, Australian, and some non-native varieties of English to help them develop their listening skills, their awareness about English pronunciation and also to generate discussion based on listening texts. The Lab provides both audio and video support to generate lively discussions on listening passages and video-cliffs. Although Language Laboratories are not as popular today as they used to be in the 1950s, they provide useful clues for meaningful language activities. Video-support makes Language Laboratory activities more interesting for students.

East West University Center for Research and Training (EWUCRT)

A university without serious research endeavors can never attain a respectable position in the community of universities. Research conducted by teachers allows them to be at the inevitably cutting edge knowledge in his/her field of specialization. Strong research activities translate into quality education. Therefore, to help create a research environment for faculty members and other researchers, East West University established has established Center for Research in Business, Economics and Technology (EWUCRT) to achieve the following goals:

- promote research activities for EWU faculty members and scholars in the field of business, economics and technology;

- provide consultancy services to various national and international organizations;

- offer executive development programs (EDPs) in management and technical areas to help train executives of both public and private enterprises;

- create database on various macro-economics variables; and

- help disseminate research outputs through publications , seminars, workshops, etc.

The main strength of EWUCRT is its fellows. All EWU faculty members are automatically fellows of EWUCRT. The presence of so many Full-time faculty members with diverse background and interest have already enriched the Center. In addition, the Center has Fellows from other institutions working in it.

EWUCRT funds research projects undertaken by EWU faculty members and conducts training programs. Its main purpose is capacity building. Young faculty members from both public and private universities participate in the center's programs. EWU is providing the lion's share of the funds needed to carry out the different research activities of the center.

EWUCRT is constantly planning to undertake many other activities independently and in some cases in collaboration with other research and development

institutions. It is exploring the possibilities of working with international development agencies such as, World Bank, IFC, ADB, etc. and also with local trade bodies, such as Dhaka Chamber of Commerce and Industries (DCCI), Metropolitan Chamber of Commerce and Industries (MCCI), etc

Software Development Center (SDC)

The mission of the Software Development Center (SDC) at East West University is to provide EWU students with real-world experience in designing and developing quality software for offices, banks, institutions and industry. Software Development Center, being a member of BASIS (Bangladesh Association for Software and Information Services), at EWU incorporates industry expertise for true software innovation and has the potential to bring in the presence of the World Wide Web. SDC believes in simplicity and efficiency.

This century has already witnessed a new paradigm of information technology where objects are embedded as living and exciting parts of the worldwide web. Software Development Center intends to integrate object-oriented programming (OOP) concept with the World Wide Web by providing unique software development services along with training and mentoring programs of global IT standard.

Software Development Center believes in quality as the first principle both in software development and in training and mentoring through prominent academicians and industry experts from home and abroad.

East West University Library

The East West University Library's mission is to support the university community in developing lifelong skills in innovative and analytical thinking in research and in information literacy, and by providing distinctive collections, services, facilities and programs.

The East West's Library holds a unique place among the private university libraries of the country. It provides an array of extraordinary facilities to its users with the help of state-of-the-art techniques and technologies. At present, the library has more than 10,500 books. It subscribes to more than thirty different journals, magazines and newsletters.

The Library has been completely automated by the Software Development Centre (SDC) of East West University. Its features include issue/circulation based on barcodes and automatic fine calculations as well as other useful features. The most exciting part of the center is the web component. Students and faculty members use the web module. Faculty members post requisitions for books using the web modules throughout the semester.

The fully air-conditioned EWU Library remains open every day of the week except on Thursday. Library users can use library facilities from 8.30 am to 10.00 pm from Saturday to Wednesday and from 3.00 pm to 10.00 pm on Friday.

In addition to a rich collection of more than 10,500 books and other reading materials, the library subscribes regularly to 11 national dailies and more than 30 acclaimed national and international journals and periodicals. It also has an excellent collection of CD-ROMs and Audiocassettes on different academic subjects. Two spacious floors house separate Circulation and Reserve and Reference Sections that can accommodate more than 200 students. There is also a separate air-conditioned Study Room where more than 100 students can hold group discussions.

The Library has the open access system, i.e. students and teachers have direct access to book shelves. Faculty members can borrow books for the whole semester. Members of the Academic Council enjoy similar book-borrowing facilities. Students can borrow CD-ROM for 1 day, textbooks for 3 days and reference books for 5 days. Apart from Current Awareness Service (CAS) and Selective Dissemination of Information (SDI), the library also provides bibliographic, abstracting, database and ready reference services.

Faculty members and students can avail themselves of the library' photocopy services. It also provides news clipping services on important subjects on a regular basis. It maintains a separate database for newspaper clippings. The library is equipped with all modern facilities including computers, printers, electronic typewriters, etc.

On-line Journals

The Library is the backbone of the research and development activities of East West University. The Library subscribes to JSTOR on-line journals i) Business collections and ii) Language and Literature collections. The full-text of more than 100 journals articles can be freely accessed by faculty members, teaching assistants, researchers, and students of East West University (EWU) and the staff of EWU, provided that they are connected to the University LAN.

EWU Library has also subscribed to ACM (Association for Computing Machinery) Portal Digital Library. All faculty members, teaching assistants, researchers, students, and staff members of EWU may visit the website of ACM Portal Digital Library and download full-text of articles from journals and proceedings papers. To use the facilities of the ACM portal digital library, interested users are requested to contact the Joint Librarian of EWU Library to obtain further information for getting access to the ACM portal, since the ACM Portal is password protected.

The EWU Library has also access to more than 150 online journals of Oxford University Press (OUP). The users of EWU Library can use its facilities for searching and browsing of publications, and of in-house and international databases, including Medline/Pubmed, HINARI, and AGORA. In addition to the above-

mentioned online journals, faculty members utilize many website resources in the delivery of excellence in teaching and in enhancing the learning environment of the University.

Other Facilities

Spacious air-conditioned class rooms

Free e-mail and Internet access

Medical Center

Prayer Room

Cafeteria

Study Room and

Separate Male and Female Common Room with indoor game facilities and TV.
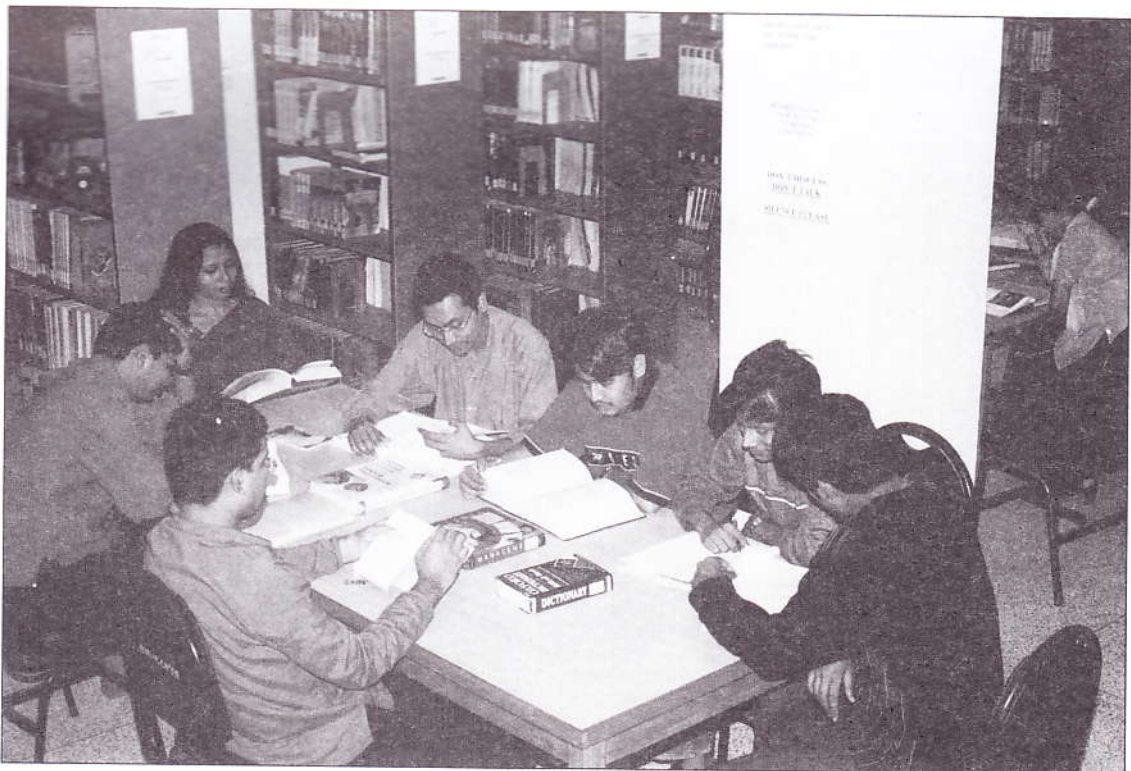
Students in the Library

Credit Transfer Policies

Credit Transfer Requirements

Students who intend to be admitted into EWU with credit transfer are considered for admission based on the result of the admission test and courses completed at public universities of Bangladesh, and other reputed private universities of Bangladesh. Credit is generally transferable, provided that course work has been successfully completed and is equivalent to that offered at East West University.

Faculty members evaluate courses already completed according to an established procedure. Courses taken at other university/institutions may satisfy the core curriculum requirements only if the courses are equivalent to EWU courses approved for the core curriculum and if a minimum C grade was earned. Course equivalencies are determined on the basis of contents, prerequisites, writing requirements, and level. Some transfer students may be required to sit for placement examinations to determine eligibility for credit transfer.

Residency Requirements

A maximum of fifty percent (50%) of credit hours for the intended undergraduate program may be accepted through credit transfer into EWU's academic program.

Important Guidelines

1. The award of credit transfer will be administered on a case-to-case basis

2. Applicant must ensure that the following documents are submitted to apply for the credit transfer at the stipulated transfer deadline:

   i. An Official Transcript of the university/institution record to date

   ii. Complete syllabus of the subjects that are applied to be credited

   iii. An application for credit transfer
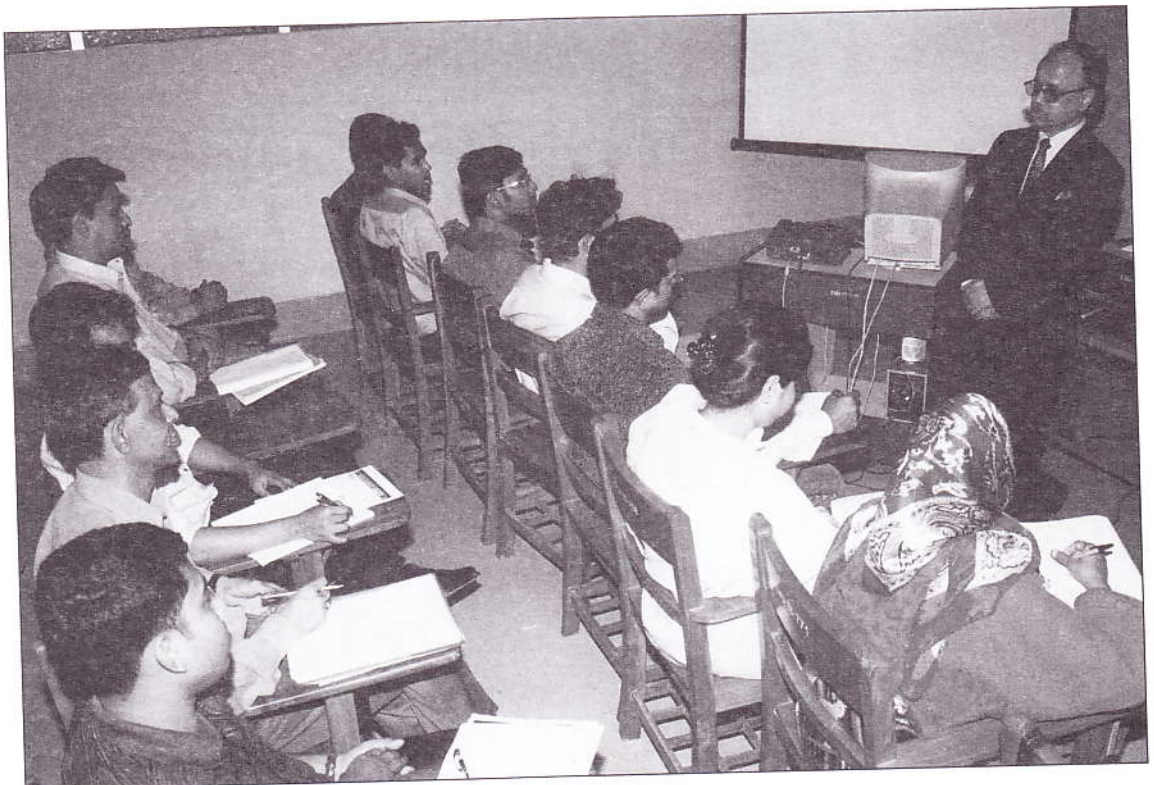
A Class in Progress

Course Registration

Course Registration On-Line

The Admission Office will notify newly accepted students about the time and place of their registration. Students are responsible for fulfilling all requirements of the degree program in which they have been admitted. They should consult their advisors in planning their course schedules and be familiar with EWU policies and procedures related to registration and graduation requirements for their degrees. Registration is incomplete until all fees are paid.

A student can not register after the scheduled date of registration mentioned in the academic calendar except by special permission of the Dean of Faculties. To avoid late fees (Tk. 500.00) students must register during the scheduled registration period.

Registration for any session of the university is contingent upon eligibility for registration. Thus advance registration, including the payment of tuition and fees, are considered invalid if the student is later declared to be ineligible to register due to scholastic reasons. Detailed information about dates and procedures for advise and registration are shown in each semester's academic calendar of the university which is available in the Registrar's Office of EWU.

Add/ Drop/Withdraw

Students who seek to add or drop courses should consult their advisors first. They must also obtain signatures of instructors of relevant courses.

Students may add courses only within the date mentioned in the Academic Calendar, if space is available, with the approval of their academic advisors.

The last day for dropping a course with and without a record entry (i.e. "W") is mentioned in the semester academic calendar. The grade "Withdrawal" (W) is assigned when a student officially drops a course within the date mentioned in the academic calendar for the semester.

The instructor may drop students from a course if they fail to attend 80 percent of the scheduled classes. The student must keep the instructors informed regarding absences in classes.

Registration Guidelines

Students should also be familiar with the following general points about registration.

1. Registration for a semester is conducted under an academic calendar. Registration starts a week before the start of classes and late registration continues till the second week of classes. Student must know his/her advisor for the completion of the registration.
2. Mere attendance does not mean registration in a class, nor will attendance in a class for which a student is not registered be a basis for asking that a program change be approved permitting registration in that class. Students should complete the registration process before classes begin.
3. After the second week of the semester, the Office of Admissions and Records will process the Official Registration form.
4. Tuition and fees are payable in advance or by installments with prior approval. A student shall not be enrolled or enrollment shall be officially deferred until at least the first installment of tuition and fees have been paid.
5. Students cannot drop a course merely by stopping attendance.
6. Students must register for a minimum of 3 (three) courses every semester.
7. The maximum number of courses a student can take in a semester is 5 (five).
8. Students, who after advising fail to pay their tuition and other fees will have to pay a fine of 50 percent of the total fees charged for the semester.

Late Registration

A student who seeks to register after the first day of the semester must have the permission of the respective Dean of Faculty. Those students who are given permission to register late must pay a late registration fee of Tk.500.00

Refund Policy

Applications for withdrawal from the university or from a course after the registration period is over must be made in writing to the Registrar. Merely notifying an instructor will not be sufficient. In cases of authorized withdrawals, and changes in schedule/registration (adds and drops), adjustment of semester tuition and fees will be made as per provisions mentioned in the academic calendar.

No adjustment is authorized for the Admission fee or other assessed fees. Financial assistance will be awarded on the same basis as the adjustment policy.

Withdrawal as a result of serious illness or disabling accident will be subject to review by the university for possible variations from the policy described above. Such events are considered on a case to case basis. No adjustment will be made for a student who is suspended, dismissed, or expelled for breach of discipline.

Examination Rules & Regulations

Grading System

A student may earn five letter grades on the basis of his/her performance in a course. The letter grades A, B, C, and D are considered passing grades. The grade F is the failing grade. The numerical equivalents of the grades are as follows:

Numerical Scores	Letter Grade	Grade Point
97-100	A+	4.00
90 - below 97	A	4.00
87 - below 90	A-	3.70
83 - below 87	B+	3.30
80 - below 83	B	3.00
77 - below 80	B-	2.70
73 - below 77	C+	2.30
70 - below 73	C	2.00
67 - below 70	C-	1.70
63 - below 67	D+	1.30
60 - below 63	D	1.00
below 60	F	0.00
	F* Failure	0.0
	I** Incomplete	0.0
	W** Withdrawal	0.0
	R** Repeat	0.0

*   Credits for courses with this grade do not apply towards graduation.

**   Credits for courses with these grades do not apply towards graduation and are not used for the calculation of the grade point average.

The exact cut off points for assigning letter grades are at the discretion of individual instructors. The same applies to the assignment of '+' or '-' after a letter grade. This is meant to give more flexibility so that shades of performance can be '+' and '-' distinguished and rewarded with the value of 0.3 grade point by the grades.

Grade Report

Grade reports are recorded and prepared by the Registrar's Office and mailed to guardians soon after the end of each semester. Students are solely responsible for their academic progress and should contact their academic advisors as soon as possible if their performance is unsatisfactory. Failure to maintain satisfactory progress can lead to the cancellation of financial aid, academic probation, dismissal, or other equally serious consequences.

GPA and Class Equivalence

Grade Point Average earned by a student is the numerical value obtained by dividing the total grade points earned in a semester by the credits attempted for the semester. Only courses graded A+, A, A-, B+, B, B-, C+, C, C-, D+, D, and F are used to determine credits attempted.

In case students repeat courses, GPA and CGPA will be calculated on the basis of the grades obtained in the last attempt of the course(s) only. Grades obtained in course(s) in all examinations will be shown in the grade report.

Moreover, students who complete courses in addition to their normal credit requirements for graduation will inform the Registrar in writing about the courses, which s/he intends to declare for consideration towards the requirements for the degree.

EWU students are evaluated on CGPA. Comparison of the CGPA earned by EWU students to the classes earned by students in other universities in the country is as follows:

CGPA 3.00 and above   =   First Class
CGPA 2.50 to 2.99   =   Second Class
CGPA 2.00 to 2.49   =   Third Class

Probation and Dismissal

Student whose CGPA will be between 1 and 2 after the first two semesters will be placed on probation for the next two semesters. Failure to raise their CGPA to at least 2 after the probation period will lead to dismissal from the university. If a student's CGPA falls below 2 subsequently, he/she will again be placed on probation.

Academic Dismissal

A student whose CGPA falls below 1 after the first two semesters will be automatically dismissed from the university. Students who fail to raise CGPA to satisfactory levels during the probation period will face dismissal from the university.

Remedial Courses may be required for students on the basis of their scores in the English and Mathematics part of the Admission test. Students who fail to pass in remedial courses in two attempts will be placed on probation.

Once dismissed for scholastic failure, a student is ineligible to enroll in further courses, and re-admission to the university will not be allowed.

Incomplete (I)

The "Incomplete" (I) grade may be used in special circumstances. The "Incomplete" may be given only at the end of a semester to a student who has completed all other requirements except appearing in the final examination without further class attendance. The instructor must file with the Registrar an Incomplete Grade Form describing the work to be completed.

The student has the sole responsibility to take the initiative in making up the requirements for the Incomplete grade as specified by the instructor. If action is not taken within one week of the commencement of the next semester, the "I" grade will automatically be converted to "F", otherwise the "I" grade will revert to the tentative final grade (the final grade becomes an "F" if no tentative grade was assigned). In the event where the instructor from whom a student received an incomplete grade is not available, the disposition of the case involving an incomplete grade resides with the respective Dean of Faculty.

Withdrawal (W)

The grade "Withdrawal" (W) is assigned when a student officially drops a course within the date mentioned in the academic calendar for the semester.

Retake Policy

Students with a grade of "C" and below will be allowed to retake the course only once. In these cases, the better of the two grades will be used to calculate the GPA and CGPA and the other grade will appear as "R" on the grade report.

Students who wish to retake a course must obtain previous written permission of the Chairperson of the Department concerned. They will have to register for the course again and will be required to pay the usual tuition charges including lab (if applicable) and other fees.

Academic Honesty

There is a policy of zero tolerance on cheating. Any form of cheating such as copying any document or another person's work, seeking or providing help to other students during tests, or adopting any other form of unfair means during exams, will constitute grounds for disciplinary action. Instructors are expected to use reasonably practical means of preventing and detecting cheating. Any student found to be cheating will be reported to the Dean of Faculties by the relevant faculty member for disciplinary action.

Leave of Absence

Leave of absence may be granted for up to three semesters to a student in good academic standing (not to those on academic probation or subject to dismissal). A student applying for a leave of absence must give a definite semester for re-registration and must register in the following semester, immediate after the leave period. A leave of absence is granted through the Dean of Concerned Faculty. A student who does not return for re-registration at the specified semester will be classified as "Officially Withdrawn" and must apply for re-admission to the Registrar.

Absence from Examinations

In the case where a student has been absent from the examination of any subject due to medical or humanitarian reasons, the student must notify to the respective faculty member within 48 hours of the conduct of the examinations on his/her standings. The faculty member may decide to record the grade as "Incomplete (I)" based on the support documents provided by the student along with the application for incomplete and take a supplementary examination within the stipulated time frame given by the university. In case the reason for the absence is found unacceptable, the respective faculty member would follow the university guideline to assess the student's case and act accordingly.

Recipients of Merit Scholarships with the Hon'ble Education Minister, Dr. M. Osman Farruk, M.P

Scholarships and Financial Aid

Since its inception, East West University has been awarding merit scholarships and need-based financial assistance to deserving students. Every semester the university distributes at least 7% of its total earnings among 17% or more of its regular students. Such scholarships/financial assistance are not available to those students who have already spent the normal study time required for the programs for which they are enrolled (e.g. Bachelor program students are not eligible for any scholarship/financial aid from the fifth year onwards.) In order to be able to further support and nurture the merit of students, particularly from the middle class and from outside the metropolis, the Board of Directors of East West University have set up a fund called "The East West University Medha Lalon Fund" with an initial endowment of Taka one and a half crore.

According to the provision of the Private University Act, 1992, private universities must provide scholarships to 5 (five) percent of its enrolled who are poor but meritorious students. Since its inception, the founders of East West University adopted a policy of not paying any profit or dividend to themselves but to use a good part of its operating surplus towards nurturing merit and providing financial support to those in need. In the last eight years, the scholarship and financial aid policy adopted by East West University has become a source of great encouragement to meritorious but financial income deficient students. The academic world has greeted this policy pursued by East West University enthusiastically.

Benefits have been awarded in the following forms:

Merit Scholarships

Full Tuition Merit Scholarships for thirty credits are awarded to

1. those who have scored A+ grade in the most recent HSC examination excluding the marks optional subject or 4 A's in "O" level and two A's in "A" level examinations for a full-year (30 credits for bachelor programs) tuition waiver scholarship; the scholarship is extendable under '2' below.

2. for bachelor programs too, top 10% (based on merit and subject to a minimum CGPA of 3.90) students of each batch of each Department completing at least 30 credits during the immediate past academic year for thirty credits in the next three semesters.

3. for masters (graduate) programs, top 10% (based on merit) students of each batch of each Department scoring a minimum CGPA of 3.90 during the immediate past year (24 credits) full tuition merit scholarships for 24 credits in the next three consecutive semesters.

4. two best results in Undergraduate and one best result in Graduate Admission Test each semester with a minimum score of 75% full tuition for one year's full program load.

Directors Scholarships

Each of the fifteen Founder Directors of the university, at a point of time, awards two full tuition scholarships to two students or splits the scholarships into half or quarter tuition waiver/scholarships. This is renewable at the discretion of the Founder Director concerned unless the recipient scholar performs very poorly.

Financial Aid

(a) General

At the beginning of each semester the university considers, on application in prescribed forms, granting of financial aid to deserving students on a need-cum-merit basis. Applicants achieving the minimum prescribed CGPA of 2.50 in the last academic year (30 credits for undergraduate programs and 24 credits for the graduate programs in the three consecutive semesters) with demonstrated financial need shall be offered financial assistance to cover part of the tuition for the next thirty credits, the actual amount often depending on the number of applicants and availability of funds. This is by far the largest component of the funding support both in terms of the amount of money as well as the number of recepients/beneficiaries.

(b) **Family Concession**

For a second child of the same parents studying simultaneously with another child at East West University, the second one is entitled to a half tuition waiver. Both the children must be admitted full time into regular programs. The benefit commences on the date of admission of the second child and ceases on the discontinuation of the study of any one of them, after his/her graduation or for any other reason. This benefit may extend upto the third child of the same parents under the above mentioned conditions.

The table below shows the number of recipients/beneficiaries of various scholarship and financial aid programs in the last five years:

Name of Scholarship/ Financial Assistance	1999 No. of Students	1999 Amount Taka	2000 No. of Students	2000 Amount Taka	2001 No. of Students	2001 Amount Taka	2002 No. of Students	2002 Amount Taka	2003 No. of Students	2003 Amount Taka	2004 No. of Students	2004 Amount Taka
Merit Scholarship (Place Holders + Merit Scholarship Awardees)	20	1,092,000	29	1,262,300	42	1,882,400	50	2,660,650	82	4,439,500	104	6,048,600
Medha Lalon Fund Financial Aid	- / 18	- / 280,200	- / 43	- / 756,600	- / 66	- / 1,551,850	- / 70	- / 1,673,800	30 / 127	720,600 / 2,033,900	59 / 342	1,324,200* / 6,573,126
Half Tuition Family Assistance	17	457,000	33	835,900	47	1,253,200	60	1,543,800	90	2,382,975	132	3,414,675
Directors Quota	-	-	-	-	4	163,800	16	923,600	22	1,099,400	33	1,363,050
Special Assistance	-	-	-	-	-	-	15	205,100	15	285,800	20	291,950
Total	55	1,829200	105	2,854,800	159	4,851,205	211	7,006,950	366	10,962,225	690	19,015,601
Percentage (%) of net Tuition Receipts	5.00%		5.02%		5.57%		5.92%		6.75%		8.02%	
Percentage (%) of net Student Enrollment	13.20%		13.20%		13.25%		11.25%		14.00%		18.03%	

* Percentage has been calculated excluding Medha Lalon Fund

As is evident from the above, university policy is quite generous in nurturing merit since an increasing percentage of tuition income gets ploughed back to and goes to deserving students. It is worth noting that the university encourages, as a matter of policy, enrolment of mofussil students who are also, therefore, beneficiaries of the scholarship and financial aid awards. The university has also been consciously endeavoring to increase the proportion of female students who also benefit from the scholarship & financial aid programs.

The Medha Lalon Fund

In order to be able to extend further support towards nurturing merit, particularly to students of middle class background, to female students, and to students from outside the metropolis, the Board of Directors of East West University set up in 2002 a scheme called the East West University Medha Lalon Fund with an initial endowment of Taka one and a half crore. The Board has sanctioned an amount of Taka one crore thirty lakhs from the operating surplus of the university for the Fund; this is in addition to the disbursement each year on regular components such as the merit scholarships and financial aid. Five philanthropic persons/organizations have contributed a combined amount of Taka twenty-seven and a half lakhs to the Medha Lalon Fund. From the annual earnings of the East West University Medha Lalon Fund deposited in a lucrative five year interest earning Scholarship Deposit Account of Mercantile Bank, need-cum-merit based financial aid is being awarded.

The scholarships being offered under the scheme is as follows:

1	Sujat Ali Mazumder Scholarship	Tk. 35,000 a year
2	Anjuman Ara Begum Scholarship	Tk. 35,000 a year
3	S.M. Sahiruddin Scholarship	Tk. 35,000 a year
4	Rowshan Ara Begum Scholarship	Tk. 35,000 a year
5	Sanuwar Bakht Chaudhury Scholarship	Tk. 35,000 a year
6	Sofia Khatun Scholarship	Tk. 35,000 a year
7	Lutful Bari Md. Munsur Chaudhury Scholarship	Tk. 35,000 a year
8	Shamsunnessa Begum Scholarship	Tk. 35,000 a year
9	Sherifa Chowdhury Scholarship	Tk. 35,000 a year
10	Sherifunnesa Begum Scholarship	Tk. 35,000 a year
11	M. Mahtabuddin Scholarship	Tk. 35,000 a year
12	Chamak Chand Scholarship	Tk. 35,000 a year
13	M. Sujat Ali Scholarship	Tk. 35,000 a year
14	Shakina Khatun Scholarship	Tk. 35,000 a year
15	Mujibur Rahman Lasker Scholarship	Tk. 35,000 a year
16	Khodeza Abu Taher Scholarship	Tk. 35,000 a year
17	Moulvi Muhammad Shamsher Ali Scholarship	Tk. 35,000 a year
18	Momena Khatun Scholarship	Tk. 35,000 a year
19	Hajee Shabuddin Scholarship	Tk. 35,000 a year
20	A.B.M. Ghulam Mohiuddin Scholarship	Tk. 35,000 a year
21	Abu Ahmed Abdul Hafiz Scholarship	Tk. 35,000 a year
22	Syeda Shaher Banu Chaudhurani Scholarship	Tk. 35,000 a year
23	Abdul Kaher Scholarship	Tk. 35,000 a year
24	Habiba Khatun Scholarship	Tk. 35,000 a year
25	Alhajj Abdur Rahman-Begum Walida Rahman Scholarship	Tk. 35,000 a year
26	Justice Nurul Huda-Begum Sufia Huda Scholarship	Tk. 35,000 a year
27	M.A. Haque Scholarship	Tk. 35,000 a year
28	Abdur Rahman Scholarship	Tk. 35,000 a year
29	Abdul Jabbar Scholarship	Tk. 35,000 a year
30	Abdus Samad Scholarship	Tk. 35,000 a year
31.	Dutch Bangla Bank Scholarship	Tk.25,000 a year
32.	Dutch Bangla Bank Scholarship	Tk.25,000 a year
33.	Dutch Bangla Bank Scholarship	Tk.25,000 a year
34.	Suraiya Farashuddin Scholarship	Tk.25,000 a year
35.	Suraiya Farashuddin Scholarship	Tk.25,000 a year
36.	Standard Chartered Bank Scholarship	Tk.25,000 a year
37.	Standard Chartered Bank Scholarship	Tk.25,000 a year
38.	Eakub H. Chowdhury Scholarship	Tk.25,000 a year
39.	Eakub H. Chowdhury Scholarship	Tk.25,000 a year
40.	Mercantile Bank Scholarship	Tk.25,000 a year
41.	Mercantile Bank Scholarship	Tk.25,000 a year
42.	East West University Scholarship	Tk.35,000 a year
43.	East West University Scholarship	Tk.35,000 a year
44.	East West University Scholarship	Tk.35,000 a year
45.	East West University Scholarship	Tk.35,000 a year
46.	East West University Scholarship	Tk.35,000 a year
47.	East West University Scholarship	Tk.35,000 a year
48.	East West University Scholarship	Tk.35,000 a year
49.	East West University Scholarship	Tk.35,000 a year
50.	East West University Scholarship	Tk.35,000 a year
51.	East West University Scholarship	Tk.35,000 a year
52.	Naushaba-Kalim Sharafi Scholarship	Tk.30,000 a year
53.	Mutual Trust Bank Ltd. Scholarship	Tk.22,000 a year
54.	Mutual Trust Bank Ltd. Scholarship	Tk.22,000 a year
55.	Prime Bank Ltd. Scholarship	Tk.25,000 a year
56.	Prime Bank Ltd. Scholarship	Tk.25,000 a year
57.	Eastern Bank Ltd. Scholarship	Tk.25,000 a year
58.	Eastern Bank Ltd. Scholarship	Tk.25,000 a year

The East West University Medha Lalon Fund is administered by the Financial Aid Committee of the university. Applications for financial aid is processed at the beginning of each semester along with and as per the manner described in 3(b). The recipients are then ranked in descending order of need. The higher of the amount between the Medha Lalon Fund Scholarships or the regular financial aid of the university is awarded to applicants with the maximum need. No student of the university is entitled to benefit from more than one scholarship/financial aid facility at any point of time.

The university charges a minimum amount (less than one percent) as administration costs from the earnings of the East West University Medha Lalon Fund. It ensures maintenance of regular accounts of the Medha Lalon Fund and has the accounts externally audited every year.

The Financial Aid Committee keeps Medha Lalon Fund informed donors about the operation of the fund on a regular basis. The Committee arranges meetings with the donors to the East West University Medha Lalon Fund to apprise them of the operating procedures, scholarship awards and performance of the scholarship awardees as well as to seek guidance of the donors. The selection of the scholars and financial aid beneficiaries is done through a computerized system that ensures full transparency.

List of Courses

ACT 101: Financial Accounting
Introduction, accounting concept and classified financial statement, Measuring and recording business transaction, Business income and adjusting entries, Completing the accounting cycle, Accounting for merchandising operations, Accounting information systems, Internal control and cash. Accounting for receivables, Inventories, Plant assets, Natural Resources and Intangible assets and accounting principles.
Credits: 3 Prerequisite: BUS101

ACT 201: Management Accounting
Introduction to management accounting, fundamentals of cost volume analysis and product costing, management reporting and information and decision making, introduction to budgets and standards for planning, control and performance measurement.
Credits: 3 Prerequisite: ACT101

ACT 311: Taxation
Examines tax entities, concept of income, deduction of credits, recognition and non-recognition of gains and losses from disposition of property, distributions form and liquidation of the business entity, administration provisions of the tax law, and tax planning.
Credits: 3 Prerequisite: ACT201

ACT 411: Intermediate Accounting-I
Accounting concepts, principles and theory with an emphasis on the special problems that arise in applying these concepts for external reporting purposes, emphasis on the use of accounting information as a basis for decisions for management, stockholders, creditors, and other users of financial statements and accounting reports.
Credits: 3 Prerequisite: ACT201

ACT 421: Intermediate Accounting-II
Examines accounting concepts, principles and theory with an emphasis on the special problems that arise in applying concepts of financial accounting for external reporting purposes.
Credits: 3 Prerequisite: ACT411

ACT 427: Auditing
Surveys the auditing converting issues common to external and internal auditing. Topics included: auditing theory, evidential matter, principles of internal control, sampling, testing and the application of computerized techniques.
Credits: 3 Prerequisite: ACT421

ACT 430: Accounting Information System
Examines the fundamental of accounting systems design, including system analysis and design techniques, Surveys hardware and software considerations, analyzes accounting applications with fundamental areas of the firm and studies the control of computerized systems in a business environment.
Credits: 3 Prerequisite: ACT 201, MIS305

ACT 441: Cost Accounting
Use of approaches of cost accounting to enable students to apply costing methods and techniques to assist with special emphasis on standard costs, process costing, joint-product and by-product costing, relevant cost, direct cost, cost-volume-profit relationship and responsibility accounting.
Credits: 3 Prerequisite: ACT201

ACT 456: Accounting Theory
This course is a study of theoretical framework, elements of financial statements along with their reporting and disclosure with emphasis on recent trends and developments in the agenda and pronouncement of the standard setting bodies (e.g. FASB and IASC). Topics include structure of accounting, their approaches to the formulation of accounting theory, conceptual framework for financial accounting; development of accounting, revenues, expenses, gains, losses, income, assets, liabilities, statement of changes in financial position and their disclosure. Students conduct independent research on financial accounting and reporting issues.
Credits: 3 Prerequisite: ACT421

ACT 478: Advanced Accounting
A study of detailed knowledge of accounting principles, concepts, techniques to explore more complex accounting problems along with preparing financial reports of organizations for the users explaining the international dimensions of financial accounting and compare different practices. Topics include financial reporting fundamentals, financial reporting and accounting concepts, segment reporting, interim financial reporting, consolidated financial statements with special problems and foreign currency translation.
Credits: 3 Prerequisite: ACT421

BUS 101: Introduction to Business
This course covers the following topics: business and its importance and need, forms of business ownership, business environment, ethics, international business, fundamentals of management, human resources

management, motivation, marketing, financial management and investment, and fundamentals of accounting.
Credits: 3 Prerequisite: None

BUS 231: Business Communication
Study of communication as a tool of administration and management, practice in writing a wide variety of types and forms of communication, and inclusion of oral and visual with the written to provide and integrate approach.
Credits: 3 Prerequisite: ENG102

BUS 361: Legal Environment of Business
An overview of the legal, social and ethical dimensions which influence business with particular attention to the role of law as a control factor of society in the business world.
Credits: 3 Prerequisite: None

BUS 498: Project Work
The coordinating instructor must assign the individual student for a specific topic. The student must submit a proposal at least a semester before he/she actually starts working on this project report. Students completing 105 credits may be allowed to enroll in this course with the permission of the chairperson and course instructor.
Credits: 3

BUS 499: Internship
This working experience enables students to apply the principles and practices of business in the local setting. This will provide the students with the opportunity to get real life exposure in the contemporary business environment of Bangladesh. Students completing 105 credits with a minimum CGPA of 2.5 may be allowed to enroll into this course with the permission of the chairperson and course instructor.
Credits: 3

CHE 101: Introduction to Chemistry
Atomic Properties and Binding Forces: Atoms, molecules and forces between them, Forces in solids and bindings, Ionic bond, Covalent bond, Metallic bond, Hydrogen bond and Vander Wall's force; properties of gases.

Oxidation and Reduction: Oxidation and reduction, Oxidation number, Analytic reagents.

Acid and Bases: Strong and weak acids and bases, pH, Buffer solutions, Neutralization curves, Indicators for acid-base titrations.

Chemical Equilibrium & Thermodynamics: Chemical equilibrium; concepts of chemical thermodynamics and thermochemistry; electrolysis, Galvanic cells, electrodes and electrode reactions, reduction potential, the chemical series, standard hydrogen electrode, Measurement of pH.

Chemical Solutions: Different types of solutions and their colligative properties.

Selective Organic Compounds: Aliphatic and aromatic organic compounds with their derivatives.

Basics of Biochemistry: Amino acids, Peptides and proteins, Hemoglobin as an allosteric model, Enzymes, Cofactors, Bioenergetics, Membrane transport, Metabolism of proteins, Carbohydrates, Lipids, Nucleic acids. The course includes lab work based on theory taught.
Credits: 4; Prerequisite: None.

CSE 101: Introduction to Computers I
An introduction to the skills, concepts, and capabilities necessary to effectively use information technology, i.e., computers and communication. The skills include standard applications to email, word processing, and Web search. The concepts include digital representation of information, computer basics and introductory programming. Capabilities include managing complexity, debugging, and dealing unexpected consequences. The course includes lab works based on theory taught.
Credits: 3; Prerequisite: None

CSE 102: Introduction to Computers II
Fundamental of Information Systems, Operating Systems, Programming Languages, Database Systems, Computer Networks, Computer Graphics, HTML/DHTML, Web Design, E-Commerce, Multimedia and other recent development in computing fields. The course includes lab works based on theory taught.
Credits: 3, Prerequisite: CSE 101

CSE 105: Structured Programming
Introduction to digital Computers. Programming algorithms and flowchart construction. Information representation in digital computers, binary number system, binary arithmetic, binary codes. Writing, debugging and running structured programs using C language: data types, variables, constants, operators and expressions, assignments and type conversion in assignments, control flow, functions and program structure, pointers and arrays, strings, advanced data types, pointer to functions, user defined data types, advanced operators, records, input/output, dynamic variables and linked lists, recursion, and graphics programming. The course includes lab works based on theory taught.
Credits: 3+1=4; Prerequisite: none.

CSE 107: Object Oriented Programming
Concepts of object oriented programming: objects, polymorphism, inheritance. Object oriented programming with C++ language: classes, parameterized constructors, friend functions, multiple inheritance, passing object to functions, arrays of objects, pointer to objects, function and operator overloading, overloading constructor functions, references, inheritance, virtual functions and polymorphism, I/O class library, streams, creating insertors and extractors, formatting I/O, file I/O, dynamic allocation using new and delete, static class members, complex and BCD classes, the message based philosophy. Using C++'s memory model, using

VROOMM overlay technology, using command line compiler, compiling multiple file programs. Standard Template Library. Exception handling. Introduction to Java language. The course includes lab works based on theory taught.
Credits: 3+1=4; Prerequisite : CSE 105.

CSE 205: Discrete Mathematics
Mathematical logic: propositional calculus, predicate calculus. Permutations, Combinations and Discrete Probability. Set theory: sets, relations, partial ordered sets, functions. Graph theory: graphs, paths, trees. Recurrence Relations and Recursive Algorithms. Algebraic structures: binary operations, semi groups, groups, permutation groups, rings and fields, lattices.
Credits: 3; Prerequisite: MAT 101

CSE 207: Data Structure
Data types, abstract data types and data structures. Efficiency of algorithms. Sequential and linked implementation of lists. Linked list and applications. Stacks and Queue and applications. Tree representations and traversals, threaded trees, heaps, binary search tree, AVL tree, B- tree, digital search tree, Tries. Searching, priority queues, hashing, Graphs, DFS and BFS, shortest path and minimum spanning tree. Garbage collection. Dynamic storage allocation. Internal and external sorting. The course includes lab works based on theory taught.
Credits :3+1=4; Prerequisite :CSE 105, CSE 107.

CSE 225: Numerical Methods
Solution techniques for linear, simultaneous algebraic equations: iterative methods of solution of nonlinear equations, interpolation of curve fitting, numeric integration by interpolative and quadrature methods; numerical solution of ordinary differential equations including initial value eigenvalue problem and boundary value problem, matrices. The course includes lab works based on theory taught.
Credits: 3; Prerequisite: CSE 105, CSE 107.

CSE 245: Algorithms
Techniques for analysis of algorithms. Methods for design of efficient algorithms: divide and conquer, greedy method, dynamic programming, backtracking, branch and bound. Searching and sorting algorithms. Graph algorithms. String manipulation algorithms. Arithmetic algorithms. Number theoretic algorithms. Lower bound theory, NP-hard and NP-complete problems. The course includes lab works based on theory taught.
Credits: 3+1=4; Prerequisite: CSE 105, CSE 107, CSE 207.

CSE 255: Digital Logic Design
Review of Binary number system, Boolean algebra, Simplification of Boolean Functions, Logic gates, Combinational Logic, Arithmetic and Comparator Circuits, Encoders and Decoders, Multiplexers and Demultiplexers, Flip-Flops, Sequential Logic, Registers, Counters, Programmable Logic devices. The course includes lab works based on theory taught.
Credits: 3+1=4; Prerequisite: None.

CSE 275: Operating Systems
Principles of operating systems. Process management, memory management, auxiliary storage management and resource allocation. Operating system design and construction techniques. Concurrent programming, operating system kernels, correctness, deadlock, protection, transaction processing, design methodologies, comparative structure of different kinds of operating systems and other topics.
Credits : 3; Prerequisite : CSE 105, CSE 107, CSE 207

CSE 301: Database Systems
Fundamental concepts. System organization and implementation of database systems. Relational, hierarchical and network data models. File organizations and data structures. Query languages, query optimization. Database design. Concurrency control. Security issues evolving distributed database systems. The course includes lab works based on theory taught.
Credits : 3+1=4; Prerequisite : CSE 105, CSE 107.

CSE 350: Data Communications
Principles involved in data communication. Modulation techniques, Pulse Modulation, Pulse amplitude modulation, pulse width modulation, pulse position modulation, pulse code modulation, pulse position modulation, quantization, Delta modulation, TDM, FDM, OOK, FSK, PSK, QPSK. Representation of noises, probability of error for pulse system, concept of channel coding and capacity, asynchronous and synchronous communications. Multiplexers, concentrators and buffers, communication medium, fiber optics.
Credits : 3; Prerequisite : MAT 101, MAT 102, EEE 109, EEE 251.

CSE 360: Computer Architecture
Study of architectural concepts in computer systems. Computer arithmetic and arithmetic logic unit design. Memories, memory hierarchies and dynamic address translation. CPU characteristics, performance factors. Control unit design: hardware and micro-program, microprogramming. Interrupt mechanism. DMA. Pipelining.
Credits : 3; Prerequisite : CSE 255.

CSE 401: Information System Analysis and Design
Application Development Policy and Strategies: Planning of Information System, Policy in Information System Development, Strategies for achieving Information System goals. Application System Development Life Cycle: Phases in Application System Development, interrelationship among each phase. Feasibility assessment: problems and needs in Information System

Development, preliminary application requirement determination, economic, technical operational and schedule feasibility. Information Requirements Determination: Strategies for obtaining information requirements, techniques for information requirements determination, methods for providing assurance that requirements are correct and complete. Structured System Analysis: Steps in Structured System Analysis, Activity Diagrams and related documentation, data dictionary, problem analysis, structured walk through. System Design Methodology: CheckList Methodology, Process-Oriented Methodology, Application Generator, Structured Design. Program Development and Testing: Structured Programming, Method for Testing.
Credits: 3; Prerequisite: CSE 105, CSE 107, CSE 275, CSE 301.

CSE 405: Computer Networks
Computer network architectures, protocol layers. Transmission media, encoding systems, error detection, multiplexing, switching. Data link, multiple access channel protocols. Network security, privacy. Applications including network management, electronic mail, virtual terminals, URL, HTTP, Multimedia, distributed operating systems. The course includes lab works based on theory taught.
Credits: 3; Prerequisite : CSE 207, CSE 245, CSE 350.

CSE 409: Systems Programming
Differences and similarities in machine organization, central processors. Fundamentals of machine language and addressing. Assembly language programming. Assembler: general design procedure, table processing. Macro language and macroprocessor. Loaders: design of absolute loader and direct link loader. Linkers. Translators.
Credits : 3; Prerequisite : CSE 105, CSE 107.

CSE 410: Artificial Intelligence
Artificial intelligence techniques. Logic: propositional logic, first-order logic, resolution principle. Problem representation: state-space representation, problem-reduction representation. Production system: PS structure, recognition-action cycle, inference directions, blackboard systems, PS implementation. Frame representation: basic structure, inheritance of properties, slot extension, implementation. Relational data model: relational database model, entity and relationship, generalization and aggregation. Search: blind and non-blind searches, depth-first search, breadth-first search, heuristic search, best-first search, optimal search, A search. Implementation complexity. Programming Languages for AI Research: Features of AI programming languages. Major AI programming languages - LISP and PROLOG.
Credits : 3; Prerequisite :CSE 105, CSE 107, CSE 207.

CSE 411: Software Engineering
Software: Its nature and qualities. Software Engineering Principles: Rigor and formality, separation of concerns, modularity, abstraction, Incrementally. The Software Process: Process models, planning, cost estimation and project control, software design. Modularization: structure, representation, interface and information hiding, design notations. Object-oriented Design: Object paradigm, introduction to a specific object-oriented design technique. Software Specification: Operational specification - semi-formal schemes, asynchronous systems - Petri nets, Descriptive specification - traditional scheme, ER model and logic, introduction to a formal scheme (Z). Software verification, software testing, Software tools and environments.
Credits : 3; Prerequisite : CSE 105, CSE 107, CSE 207, CSE 245, CSE 301.

CSE 412: Programming with JAVA
Java and Internet, Java foundation, Control flow, Abstract classes and packages, Exception Handling, Applets, Web based Java application, Multithreading, Network programming, Graphics, Human-Computer Interactio, Risk and liabilities of Computer based Systems, Future Developments. The course includes lab works based on theory taught.
Credits : 3+1=4; Prerequisite : CSE 105, CSE 107.

CSE 413: Automata Theory and Theory of Computations
Computational models including finite automata, regular expressions, context-free grammars, pushdown automata, Turing machines, and techniques for analyzing them. Languages described by these machines and their properties. Chomsky Hierarchy. Basic computability theory and Church-Turing Thesis. Undecidability, Post correspondence problem. Fundamentals of computational complexity theory. Intractable problem and NP-completeness. Some NP complete problems. Cook's theorem. Approximation algorithms.
Credits : 3; Prerequisite : CSE 207, CSE 245.

CSE 415: Software Development Project
Students will develop large application/ database/ Internet software(s) with proper documentation as assigned by teacher.
Credits: 3; Prerequisite: CSE 105, CSE 107, CSE 207, CSE 245, CSE 301.

CSE 420: Computer Graphics
Introduction to computer graphics. Graphics I/O devices and types. Graphic software design: Desired functions, Universal Graphic language, display files, Databases for pictorial applications. Graphics Techniques: Point-plotting techniques, Line drawing, Geometric transformations, Windowing and clipping, Raster graphics. Hardware for Computer Graphics: Typical small and large system graphic terminals, Plotters, Graphic

Display Processors, Device Independent Graphics Systems. Graphics Software: Simple Graphics Package, Segmented Display Files, Geometric Models, Picture structure. Interactive Graphics: Input techniques, event handling, three-dimensional graphics, curves and surfaces, 3-D transformation. Hidden Surface Problem: Back Face Removal, Hidden-Line removal. Curved Surfaces. The course includes lab works based on theory taught.
Credits 3, Prerequisite: CSE 105, CSE 107, CSE 207, CSE 245.

CSE 422: Simulation and Modeling
Simulation methods, model building, random number generator, statistical analysis of results, validation and verification techniques. Digital simulation of continuous systems. Simulation and analytical methods for analysis of computer systems and practical problems in business and practice. Introduction to the development of simulation packages.
Credits 3; Prerequisite: STA 101, CSE 105, CSE 107.

CSE 430: Compiler Design
Introduction to Compilers. Lexical analyzer, Regular expression, Non-deterministic finite automata and deterministic finite automata, Context free grammar, Ambiguous grammar, Parsing techniques, Syntax directed translation, type checking. Intermediate code, Symbol table, Data structure for symbol table, Run time storage administration, Error detection and recovery, code optimization, code generation. Use of tools - LEX and YACC. Design of a compiler for a subset of a programming language.
Credits 3; Prerequisite : CSE 207, CSE 245.

CSE 432: Digital Signal Processing
Discrete time description of signals and systems. Fourier transform of discrete time signals, Discrete Fourier transform. Z-transform. Digital filter structure, Infinite Impulse Response Filter design techniques, Finite Impulse Response Filter design techniques, Finite precision effects, Inverse filtering.
Credits: 3; Prerequisite: MAT 102, MAT 301, EEE 109, CSE 205, EEE 251.

CSE 434: Digital Image Processing
Introduction, Digital Image Fundamentals, Image Transform, Image Enhancement, Image Restoration, Image Compression, Image Segmentation, Representation and Description, Recognition and Interpretation.
Credits 3; Prerequisite: MAT 301, CSE 420.

CSE 435: Multimedia Systems Design
Overview to multimedia systems, multimedia storage. Data compression techniques for audio and video. Synchronization. Multimedia networking and protocols, QOS principles. Video streams on ATM. Mobile multimedia computations. Operating system support for multimedia. Hypermedia system. Standard for multimedia. Multimedia database and multimedia applications.
Credits 3; Pre-requisites: EEE 433.

CSE 436: Advanced Computer Architecture
Pipelined processor design, Cache memory, Memory system design, Concurrent processors, Vector processors and multiprocessors, Array processors, Parallelism in multiprocessors and Multicomputers, Compute-intensive processors and Multicomputers, Automatic Vectorization, Hypercube systems and Key application, Data flow computation.
Credits: 3; Prerequisite: CSE 275, CSE 255, CSE 360.

CSE 438: Digital Computer Design
Review of MSI logic design, Registers, Counters and Memory units. Register transfer logic, micro-operations, processor logic design, control logic design, micro-Programd control, pipeline and vector processing, computer arithmetic, microcomputer system design: case study.
Credits: 3; Prerequisite: CSE 255, CSE 360.

CSE 442: Microprocessors and Microcomputers
Introduction to different types of microprocessors, Architecture, Instruction Format, Instruction Sets, Opcode, Processor status and Flag registers, Addressing modes, Branching and Looping, Interrupt structures, I/O operation, I/O interfacing, DMA. Programming in Microcomputers. Hardware and Software interfacing in Microcomputer System Design, I/O design and total system design. Microprocessor based system design: Hardware design, building, debugging, testing and linking program modules. Programming EPROM. Multiprocessor configurations: coprocessor configurations, numeric data processor, I/O processors. Advanced Microprogramming: Bit-Slice Microprocessor, Parallelism in Microprocessor. The course includes lab works based on theory thought.
Credits 3+1=4; Prerequisite: EEE 109, EEE 251 CSE 255, EEE 380.

CSE 444: Fault Tolerant Computing
Faults and their manifestation, issues, theory, and techniques of reliable systems design, testing, design for testability, self-checking and fail-safe circuits, coding techniques, system-level fault diagnosis, fault-tolerant communication, reliable software design, and evaluation criteria.
Credits 3; Prerequisite :CSE 255, CSE 360.

CSE 450: Data Structure and Algorithm
Data Types and Data Structures. Analysis Of Algorithms. List, Its Sequential, Linked, Stack and Queue Implementations and Applications. Tree Representations And Traversals. Binary Search Tree, Heaps, AVL Tree And B+ Tree. Searching and Hashing. Methods for Design of Efficient Algorithms: Sequential Method, Divide And Conquer Method, Greedy Method and Dynamic Programming. Sorting Algorithms. Graph Representation, DFS and BFS. Graph Algorithms: Shortest Path Algorithms and Minimum Spanning Trees.

String Manipulation Algorithms. Number Theoretic Algorithms. The course includes lab works based on the concepts introduced.
Credits:3+1= 4; Pre-requisites: CSE 105.

CSE 452: Distributed Systems and Algorithms
Formal approaches to distributed computing problems. Topics vary, but typically include models of distributed computing, agreement problems, impossibility results, mutual exclusion protocols, concurrent reading while writing protocols, knowledge analysis of protocols, and distributed algorithms.
Credits : 3; Prerequisite : CSE 245, CSE 275.

CSE 460: Programming Language Principles
A study of non-imperative programming paradigms such as functional, object-oriented, logic, and constraint programming. Programming language semantics and type theory.
Credits : 3; prerequisite : CSE 301.

CSE 464: Advance Database System
Introduction to the principles of database management systems. Topics include database system architecture, data models, theory of database, query optimization, concurrency control, crash recovery, and storage strategies.
Credits : 3; prerequisite : CSE 301.

CSE 470: Expert Systems
Basic principles of Expert Systems. Natural Language Processing, Medical diagnostics, Financial design, and Manufacturing planning.
Credits : 3; Prerequisite : CSE 410.

CSE 474: Pattern Recognition
Introduction to pattern recognition. General pattern recognition concepts. Statistical pattern recognition. Supervised learning using parametric and non-parametric approaches. Linear discriminant functions and the discrete and binary feature cases. Unsupervised learning and clustering. Syntactic Pattern Recognition: Syntactic recognition via parsing and other grammars, graphical approach to syntactic pattern recognition, learning via grammatical inference. Neural Pattern Recognition: Neural pattern associators and matrix approaches, unsupervised learning in neural pattern recognition.
Credits : 3; Prerequisite : CSE 410.

CSE 476: Neural Networks
Introduction to neural networks. Neuronal Dynamics: Activation and signals, activation models. Synaptic Dynamics: Unsupervised and supervised learning. Neural network architectures and equlibria.
Credits : 3; Prerequisite : CSE 410.

CSE 478: Stochastic Processes
Probability distribution and expectations, discontinuous probability distributions, continuous probability distributions. Stochastic process. Discrete time Markov chain and continuous time Markov chain. Birth-death process in queuing. Queuing Models.
Credits 3; Prerequisite : STA 102.

CSE 480: Web Database Programming
Designing an Internet utilizing a range of different technologies. Simplifying the creation and updating web content. Expanding Intranet services by adding client-slide and server-side processing. Interfacing Internet to a database. Querying a database using Cold Fusion.
Credits 3; Prerequisite : CSE 301, CSE 412.

CSE 482: Parallel Computation
Survey of parallel computing including the processing modes of pipelining, data parallelism, thread parallelism, and task parallelism; algorithmic implications of memory models; shared memory and message passing; hardware implementations; bandwidth and latency; synchronization, consistency, inter-processor communication; programming issues including implicit and explicit parallelism, locality, portability.
Credits 3; Prerequisite : CSE 245.

CSE 484: Computational Geometry
Problems in computational geometry, worst case complexity of geometric algorithms; expected complexity of geometric algorithms and geometric probability, geometric intersection problems, nearest neighbor searching, point inclusion problems, distance between sets, polygon decomposition, the Voronoi diagram and other planner graph, updating and deleting from geometric structures.
Credits 3; Prerequisite : CSE 207, CSE 245.

CSE 492: Robotics
Robotic manipulation, direct kinematics: the arm equation, inverse kinematics: solving the are equation, workspace analysis and trajectory planning, differential motion and static manipulator dynamics, robot control, task planning.
Credits 3; Prerequisite: None.

CSE 498: Social and Professional Issues in Computing
History of Computing, Social context of computing, Methods and tools of analysis, Professional and ethical responsibilities, Risks and liabilities of computer-based systems, Intellectual property, Privacy and civil liberties, Computer crime, Economic issues in computing, Philosophical frameworks.
Credits 3; Prerequisite: None.

CSE 499: Internship/Project
Students will be placed for internship of one semester duration or they will be assigned a project under the

supervision of a faculty member. Student must complete the internship/project within one consecutive semester. Credits 3.

ECO 101: Principles of Microeconomics
Introduction to Economic theory . Theory of price: Demand. Theory of price: Supply. Theory of supply: Market Structure & Theory of Distribution Microeconomic policy in product & factor market.
Credits 3; Prerequisite: MAT 110 , STA 101

ECO 102: Introduction to Macroeconomics
Macroeconomic is the policy oriented part of economics. Much of our analysis in this endeavor will attempt to reveal how macro- economic variable such national income, unemployment, inflation can be manipulated by government policies. Unlike Microeconomic, hypothesis and results differ substantially in macroeconomic models due to different schools of thought.
Credits 3; Prerequisite: ECO 101

ECO 200: Agricultural Economics
Introduction of agriculture as an industry; economics of agricultural production, farm management, land economics, rural organization, agricultural credit and finance, agricultural law, agricultural marketing, agrarian reform, agricultural policy, agricultural prices, structure and scope of Bangladesh agricultural sector.
Credits 3; Prerequisite: ECO 101

ECO 214: Public Sector Economics
The course examines a number of issues in public expenditure theory and taxation. Topics on the expenditure side include the economic rationale for government, provision of public goods, corrective policies to externalities, and cost-benefit analysis. On the taxation side, topics include the question of tax incidence, efficiency effects of taxes and optimal taxation.
Credits 3; Prerequisite: ECO 101

ECO 260: Environmental & Natural Resource Economics
This course aims at exploring and examining human relationship with environment with special emphasis on Bangladesh. The course surveys the economic, cultural, social, and political aspects of human population dynamics, food resources and hunger, mineral and energy resources, air, land and water pollution, wilderness and wildlife resources, urban and rural land usage, and toxic waste management from environmental and conservation viewpoints. The course makes recommendations and probes possible solutions to contemporary resource and environmental problems of Bangladesh. Current issues important to the environment are stressed in class projects.
Credits 3; Prerequisite: ECO 101

ECO 301: Intermediate Microeconomic Theory I
Theory of choice and its application to consumer and producer behavior, theory of production and cost, output and input markets and their structure, equilibrium and efficiency, introduction to general equilibrium analysis. Special emphasis on perfect & imperfect competetion.
Credits 3; Prerequisite: ECO 101

ECO 302: Intermediate Macroeconomic Theory II
This course introduces the mainstream models in modern macroeconomics-classical models, Keynesian model of consumption and investment analysis; IS-LM models of closed and open economics dealing with unemployment, inflation and interest rates. Analysis of monetary and fiscal policies and their impact on national income, output employment & growth.
Credits 3; Prerequisite: ECO 102

ECO 304: Economics of Health
Application of economic concepts and analytical tools to the health service system. Review of empirical studies of demand and supply of health services, behavior of providers in selected developing and developed countries, and relationship of health services to population health levels. Discussion of policy issues relating to financing and resource allocation to the health sector.
Credit 3; Prerequisite: ECO 101

ECO 310: Money and Banking
Understanding money, macroeconomic role of money, the role of the banking system in the functioning of monetary policy. Principles of managing commercial banks, efficient loan portfolio management, the history and functions of the central banks.
Credits 3; Prerequisite: ECO 102, ECO 302

ECO 315: Public Finance
Study of the expenditure and financing activities of the government. Topics include fiscal functions; public sector in the economic accounts; normative theory of government (the level and allocation of government expenditures; taxation; optimum structure of major taxes; fiscal policy and stabilization; development finance); positive theory of government (direct democracy; representative democracy; bureaucracy; voter behavior; rent seeking); government and markets; efficiency aspects of public enterprises; interest-free public finance. Prerequisite: ECO 101, ECO 301.

ECO 328: International Trade and Finance
Review and analysis of international trade models, theories and tools of analysis-classical, neo-classical and alternative theories; international monetary system, its role, importance, structure and future performance; foreign exchange market, balance of payments adjustments.
Credits 3; Prerequisite: ECO 101 and ECO 102

ECO 329: Contemporary Issues in International Economics

In depth analysis of selected current issues and policy problems of the international economy including (but not restricted to) the following: new approaches to the theory of international trade, reform of the international monetary systems, role of the General Agreement on Tariffs and Trade and the United Nations Conference on Trade and Development. Problems of stabilization of international commodity markets, and balance of payments problems of Bangladesh and other selected countries.
Credits 3; Prerequisite: ECO 328 or equivalent

ECO 349: Economics of Development

Core topics are the nature of underdevelopment, growth theories, dualism, center periphery models & poverty of LDC countries. Process of cumulative causation, population and development, development and environment, foreign assistance, debt, trade are also widely discussed.
Credits 3; Prerequisite: ECO 101 and ECO 102

ECO 353: Economics of Development in South Asia

Background and analysis of plans and progress toward economic development in South Asia, their trends in development, economic characteristics of the area and their significance for economic development. Case studies are included on respective countries of South Asia to examine their economic trends & prospects.
Credits 3; Prerequisite: ECO 101 and ECO 102

ECO 354: Environmental & Natural Resource Economics II

Resource availability, environmental pollution and limit to growth. Theory of optimal use and depletion of renewable, non-renewable and recyclable resources in the context of water, forest fisheries, and mineral resources. Theory of property rights regimes such as public, private and common property ownership into resource management. Market failure, externality and economics of pollution control. Economics of regional global pollution. Pollution control policies and their implications for efficiency, equity and growth.
Prerequisite: ECO 260 - Credit 2

ECO 357: Mathematical Economics

Economic models and equilibrium analysis, linear models and matrix algebra, differentiation and comparative statics, comparative statics of general function models, optimization and equilibrium, exponential and logarithmic functions, multi variable optimization, optimization with equality constraints, economic dynamics and integral calculus.
Credits 3; Prerequisite: MAT 110, MAT 311

ECO 360: Socio-Economic Profiles of Bangladesh

It surveys the socioeconomic features and studies of the macroeconomic performance of the economy of Bangladesh within the context of the sociopolitical reality; sectoral development and analysis of the sectors in a general equilibrium framework; foreign trade and foreign aid; financial institutions and monetary management, fiscal policy, human resource development and the long term performance of Bangladesh economy.
Credits 3; Prerequisite: ECO 101 and ECO 102

ECO 382: Economic Valuation of the Environment

The principles of benefit cost analysis, shadow pricing, sustainability constraints, time, risk; techniques for non-market evaluation incorporating contingent valuation, contingent ranking, travel cost method, discrete choice, production function approach behavior, hedonic wage and property price models; modified national income accounting. Prereq: ECO 260. Credits 3.

ECO 406: International Economic Theory

This course offers advanced treatment of trade models covered in ECO 328 as well as incorporates new developments in international trade theory. Topics include neo-classical trade theory, industrial-organization based trade models, protection theory, regional integration and economic growth. Special attention on export promotion & import substitution policies of the devoloping economics.
Credits 3; Prerequisite: ECO 301, ECO 302

ECO 414: Trade Policy Analysis

Applies the theory of international economics to the problems of policy design for export promotion, import substitution, exchange rate choice and management, foreign indebtedness, capital flow and balance of payments management.
Credits 3; Prerequisite: ECO 328

ECO 433: Gender & Development

This course examines gender discrimination & gender equality as it relates to economic development. Topics include: success and failures of NCO activities that directly address women's participation in development, womanization of poverty in under developed countries.
Credits 3; Prerequisite: ECO 349

ECO 443: Social Mobilization, Rural Banking and Community Organization

This is aimed at analysing the role of grass root organizations and NGO's in development. Their achievements in activities like micro-credit, education and awareness building is discussed. Field trips are an integral part of this course.
Credits 3; Prerequisite: ECO 349

ECO 447: Applied Economics

This course analyses some selected issues in regulation and government intervention and their impacts. Advanced topics of macro & micro economics are included.
Credits 3; Prerequisite: ECO 301

ECO 449: Economics of information

Moral hazard, adverse selection in game theoretic models; Individual and social choices under incomplete and imperfect information.
Credits: 3; Prerequisite: ECO 467

ECO 450: Labor Economics

This course surveys a number of topics in labor economics, including the facts underlying the rising labor participation of women, the effects of legislation such as minimum wages and overtime regulation on wages and employment, the factors that determine wage rates paid to different individuals, and in particular the degree to which observed patterns of wages conform to the predictions of the simple competitive model versus other models of wage determination; the economics of education, discrimination in the labor market, and other selected topics.
Credits 3; Prerequisite: ECO 301

ECO 453: Game Theory and Applications

This course deals with the strategic interaction of economic agents. It focuses on economic modeling of strategic choices in a variety of situations such as firms in an oligopolistic industry choosing price or quality, collusive agreements and the incentive to cheat, inflation and unemployment, tariffs and international competition, etc. Topics include zero sum games, variable sum games, solution concepts, Nash equilibrium, pure and mixed strategies, repeated games, dominant strategies, sequential games, subgame perfection, and games with incomplete information. Prereq: ECO 101, ECO102, ECO301.

ECO 460: Managerial Economics

Scope and nature of managerial optimization, optimization techniques, risk analysis, estimation techniques, demand theory, demand estimation, demand forecasting, production theory and estimation, linear programming, market structure and pricing practice, long run investment decisions, capital budgeting, cost benefit analysis, public sector management.
Credits 3; Prerequisite: ECO 301

ECO 465: Basic Econometrics

Main focus is on OLS estimate including: two-variable regression, functional form, multiple regression, multicollinearity, heterosecedasticity and autocorrelation, specification errors, dummy variables, lagged variables, identification and systems estimation.
Credits 3; Prerequisite: STA 327

ECO 467: Intermediate Microeconomic Theory II

Advanced treatment of microeconomic concepts. Traditional concepts of theories about production and consumer choice will be discussed with mathematical rigor and special emphasis will be given to market structure, strategic behavior and game theory.
Credits: 3; Prerequisite: ECO 301 and ECO 357

ECO 474: Mathematical Economics II

Dynamic analysis and its application in economic models : Harrod model, Domar model, Samuelson's multiplier accelerator interaction model. Dynamic Optimization: nature of dynamic optimization. Calculus of variation : Fundamental problem of the calculus of variations-Euler Equation, some special cases & applications of second order conditions, infinite planning horizon, constrained optimization problems, optimal control theory : The mazimum principle, infinite horizon problem, optimal control with constraints
Credits 3; Prerequisite: MAT 311, ECO 301 and ECO 302

ECO 475: History of Economic Thought

Birth of political economy, laissez faire revolution of Adam Smith, Ricardo to Mill, socialist thought and Marx, neoclassical synthesis ; theory of general equilibrium, welfare economics, Keynesian revolution & Marshall's contribution economic discipline.
Credits 3; Prerequisite: ECO 101 or ECO 102

ECO 477: Intermediate Macroeconomic Theory II

A review of macroeconomic issues, policies and tools. Different schools of macroeconomic thought, long run economic growth, neoclassical and new growth theories. Short run economic fluctuation, modern theories of business cycle, inflation and unemployment. Sectoral analysis, consumption and investment, open economy macroeconomics, macroeconomic issues and problems stemming from Monetarist Counter revolution & Modiglianis life cycle hypothesis.
Credits 3; Prerequisite: ECO 302, ECO 357

ECO 480: Urban Economics

Aspects of urban management, location and growth of cities ; system of cities & urban hierarchy, economics of urban management ; management of urban environment ; urban waste management. The structure of the urban government, its fiscal base and linkages with the external sectors : policy issues such as - determination and collection of local taxes, urban enterprise zones, urban land and housing policies, anti-poverty policies and social cost & benefit of externalities.
Credits 3; Prerequisite: ECO 214

ECO 484: Project Analysis and Evaluation

This course deals with project choice, institutional framework, cost-benefit analysis. It also covers measuring the profitability of a project under different goals - framework of project proposal - logical framework analysis - project monitoring with special reference to project proposal system used in Bangladesh. Prereq : ECO 101 and ECO102. ECO301
Credits 3

ECO 485: Cost Benefit Analysis

Cost Benefit Analysis is the principal tool for project and policy evaluation in the public sector. Given government regulations, cost benefit evaluations are critical for many

private sector activities. Real estate developers, manufacturing firms, employers of all types are required to provide evaluations of environmental impacts and of urban impacts for their proposed projects. They too must engage in cost benefit analysis, in the valuation of social benefits and costs. Government analysts, consultants, and private firms regularly carry out cost benefit analyses for major investments – bridges, roads, transit systems, convention centers, dams – as well as for regulatory activities. Topics include: conceptualization of Costs and Benefits of social projects, identifying costs and benefits, issues related to prices, shadow prices, exchange rate/shadow exchange rate, valuing environmental externalities, cost-effectiveness analysis, risk and sensitivity analysis. Monti-Carlo simulation of risks. Example includes economic valuation of social sector projects like education, transportation, etc. Prerequisite: ECO301, ECO467, ECO349

ECO 486: Energy Economics and Policy
Dimensions of the energy problems, static and dynamic criteria for efficient energy resource allocation; OPEC countries; environmental issues in energy development; price control; optimum regulation structure; national security dilemma; conservation; future policy directions. Prereq: ECO302. Credits 3

ECO 487: Applied Econometrics
This course discusses the classical linear regression model and its extensions including generalized least squares and the theory and application of F tests. The maximum likelihood principle is introduced, as are alternative approaches to testing, e.g. LR and Wald tests. Additional topics may be included at the instructor's discretion. Covers the fundamental econometric technique of regression analysis and a variety of model specification issues. A central goal is to provide students with the necessary skills and knowledge to use and to correctly interpret the output from econometrics software packages such as TSP, SPSS, SHAZAM, STATA. Prerequisite: ECO 465 Credits 3

ECO 490: Research Methodology
Topics include purpose of scientific research; features and scopes and limitations of research; classification of scientific research; techniques of data collection and selection; various biases in data collection; preparation and presentation of independent seminar. Credits 3

ECO 491: Welfare Economics
Topics include the distinction between normative and positive economics; the first and second fundamental theorem of welfare economics; Hicks-Kaldor-Scitovosky compensation criteria; consumer and product surplus for measuring welfare change ; market failure; theory of second best and its implications for policy reforms; importance of property rights and Coase theorem; poverty and distribution of income; relationship between entitlement and welfare; the extent of inequality in Bangladesh. Prereq : ECO467, MAT 317 Credits 3

ECO 492: Law and Economics
Applications of economic theory to problems and issues in both civil and criminal law and the effect of legal rules on the allocation of resources, includes property rights, liability and negligence assignment, the use of administrative and common law to mitigate market failure, and the logic of private versus public law enforcement. Prereq : ECO 301 and ECO 302 Credits 3

ECO 495: Supervised Research Paper
In this course, each student will write a research monograph on a topic of his/her choice. S/He will be supervised by a faculty. It is expected that in this research s/he will be able to synthesize a research problem. Prerequisite: ECO 490 Credit 3

EEE 101: Electrical Circuits I
DC Circuits: Fundamental electrical concepts and measuring units, D.C. voltage, current, resistance and power. Introduction to circuit theory and Ohm's law , Kirchhoff's current and voltage laws. Simple resistive circuits: Series and parallel circuits, voltage and current division, Wye-Delta transformation. Various techniques for solving circuit problems: loop and node analysis. Network theorems: Superposition theorem, Source transformation, Thevenin's and Norton's theorems with their applications in circuits having independent and dependent sources; maximum power transfer and reciprocity theorem. Energy storage elements: Inductors and capacitors, series parallel combination of inductors and capacitors. Responses of RL, RC and RLC circuits to natural and step responses. Magnetic Circuits: Magnetic quantities and variables: Flux, permeability and reluctance, magnetic field strength, magnetic potential, flux density, magnetization curve. Laws of magnetic circuits: Ohm's law and Ampere's circuital law. Magnetic circuits: series, parallel and series-parallel circuits. Electrical safety.
The course includes lab work based on theory taught. Credits 3+1=4; Pre-requisite: None.

EEE 102: Electronic Circuits I
Semiconductors: intrinsic and extrinsic semiconductors, Fermi level, n type and p type semiconductor. p-n junction diode: structure and physical operation, contact potential, current-voltage characteristics of a diode, simplified dc and ac diode models, dynamic resistance and capacitance. Diode circuits: Half wave and full wave rectifiers, Characteristics of a zener diode, zener shunt regulator, clamping and clipping circuits. Bipolar junction transistor (BJT): structure and physical operation, BJT characteristics and different regions of operations, BJT as an amplifier, biasing the BJT for discrete circuits, small signal equivalent circuit models, BJT as a switch. Single

stage BJT amplifier circuits and their configurations: Voltage and current gain, input and output impedances. Junction Field-Effect-Transistor (JFET): Structure and physical operation of JFET, transistor characteristics. Metal-Oxide-Semiconductor Field-Effect-Transistor (MOSFET): structure and physical operation of MOSFETs, body effect, current- voltage characteristics of MOSFETs, biasing discrete and integrated MOS amplifier circuits, single-stage MOS amplifiers, MOSFET as a switch, CMOS inverter. Junction Field-Effect-Transistor (JFET): Structure and physical operation of JFET, transistor characteristics.
The course includes lab work based on theory taught.
Credits 3+1=4; Pre-requisite: EEE 101

EEE 109: Electrical Circuits
Fundamental electric concepts and measuring units. D. C. voltage, current, resistance and power. Laws of electrical circuits and methods of network analysis. Principles of D. C, measuring apparatus. Laws of magnetic fields and methods of solving simple magnetic circuits. Alternating current - instantaneous and r.m.s current, voltage and power, average power for various combinations of R, L and C circuits. Phasor representation of sinusoidal quantities. Single-phase AC circuit analysis. Introduction to Polyphase circuit analysis. The course includes lab works based on theory taught.
Credits 3+1=4; Prerequisite: None

EEE 200: Electrical Design and Drafting
Basics of electrical drafting: safety rules for electrical wiring, electricity codes, electrical and electronic symbols, wiring diagram and conduit layouts for electrical connections, television cables, telephone/intercom, computer network etc.
The course includes lab work only.
Credits 0+1=1; Pre-requisite: EEE 101

EEE 201: Electrical Circuits II
Periodic functions: period and frequency. Sinusoidal functions: Instantaneous and effective (r.m.s.) values of current, voltage, power. Complex quantities, phasor representation of sinusoidal quantities. Impedance, real and reactive power, average power and power factor. Single phase ac circuit analysis: Series and parallel RL, RC and RLC circuits, nodal and mesh analysis, application of network theorems in ac circuits, circuits simultaneously excited by sinusoidal sources of several frequencies, transient response of RL and RC circuits with sinusoidal excitation. Resonance in ac circuits: Series and parallel resonance. Magnetically coupled circuits. Analysis of three phase circuits: Three phase supply, balanced and unbalanced circuits, power calculation. The course includes lab work based on theory taught.
Credits 3+1=4; Pre-requisite: EEE 101

EEE 202: Electronic Circuits II
Frequency response of amplifiers: Poles, zeros and Bode plots, amplifier transfer function, techniques of determining 3 dB frequencies of amplifier circuits, frequency response of single-stage and cascade amplifiers, frequency response of differential amplifiers. Operational amplifiers (Op-Amp): Properties of ideal Op-Amps, non-inverting and inverting amplifiers, inverting integrators, differentiator, weighted summer and other applications of Op-Amp circuits, effects of finite open loop gain and bandwidth on circuit performance, logic signal operation of Op-Amp, dc imperfections. General purpose Op-Amp: DC analysis, small-signal analysis of different stages, gain and frequency response of 741 Op-Amp. Negative feedback: properties, basic topologies, feedback amplifiers with different topologies, stability, frequency compensation. Active filters: Different types of filters and specifications, transfer functions, realization of first and second order low, high and bandpass filters using Op-Amps. Signal generators: Basic principle of sinusoidal oscillation, Op-Amp RC oscillators, LC and crystal oscillators. Power Amplifiers: Classification of output stages, class A, B and AB output stages. SCR, Diac, Triac and UJT: Characteristics and applications. The course includes lab work based on theory taught.
Credits 3+1=4; Pre-requisite: EEE 102

EEE 203: Numerical Analysis for Electrical Engineering
Numerical solution of algebraic and transcendental equations. Matrices. Interpolation. Curve fitting by least squares. Numerical differentiation and integration. Finite differences. Numerical solution of differential equations.
Credit 3; Pre-requisite: EEE 101, CSE 105

EEE 204: Electrical Measurement and Instrumentation
Measurement of resistance, inductance and capacitance. Measurement of conductivity of bulk materials. Cable faults and localization of cable faults. Magnetic measurement, ballistic galvanometers, flux meters. Measurement and separation of iron losses. Illumination measurement. High voltage measurements. Instrumentation amplifiers. Transducers: measurement of strain, pressure, temperature and flow. Measuring instruments: classification. Ammeters, voltmeters and multimeters - extension of instrument ranges. Current and voltage transformers. Measurement of power and energy: wattmeters, watt-hour meters and maximum demand indicators. Measurement of speed, frequency and phase difference. Electronic measuring instruments: Oscilloscope, Digital meters - DMM, VTVM, Q meters. Statistical methods in measurements. The course includes lab works based on theory taught.
Credits: 3+1=4; Prerequisite: EEE 201, EEE 202, for CSE students EEE 109, EEE 251.

EEE 251: Electronic Devices and Circuits

Semiconductors, Junction diode characteristics, Bipolar transistor characteristics, Small-signal low frequency h-parameter model, hybrid pie model. Amplifiers, Darlington pairs. Introduction to oscillators, differential amplifiers. Linear application of op-amp, gain, input and output impedance, offset null adjustment, frequency response and noise. Introduction to JFET, MOSFET, NMOS, and CMOS - biasing and application in switching circuits. SCR, Triac, Diac, UJT: characteristics and applications. Introduction to rectifiers, active filters, regulated power supply, stabilizer and UPS. Basic ideas about IC fabrication technique. The course includes lab works based on theory taught.
Credits : 3+1=4; Prerequisite: EEE 109.

EEE 252: Basic Electronics

Introduction to DC and AC voltage, current and Power, Classification of electrical components: resistors, capacitors and inductors. Ohm law, kirchhoffs Law: KCL, KVL and their limitations. Basic circuit analysis methods: nodal, mesh and modified nodal-analysis. Fundamentals of AC circuits, Transformer, Induction to 3-phase circuit. Semicnductor Materials and PN Junctions, Semiconductor Diodes: Barrier formation in metal-semiconductor junctions, PN homo- and hetero-junction; VI characteristics; Small signal models of diodes; Some Applications of diodes; Special diodes. Bipolar transistor: IV characteristics and small signal models; Transistor biasing; Small signal amplifiers.
Credits: 3+1=4, Prerequisite: None

EEE 300: Electronics Shop

Basics of electrical drafting: safety rules for electrical wiring, electricity codes, electrical and electronic symbols, wiring diagram and conduit layouts for electrical connections, television cables, telephone/intercom, computer network etc.
The course includes lab work only.
Credits 0+1=1; Pre-requisite: EEE 101, EEE 102

EEE 301: Electrical Machines I

Basics of electromechanical energy conversion: Faraday's law of electromagnetic induction, Fleming's rule and Lenz's law. Elementary generator: electromagnetic force, left hand rule. Ideal transformer - transformation ratio, no-load and load vector diagrams; Actual transformer - construction, equivalent circuit, regulation, short circuit and open circuit tests, parallel operation; Auto transformer. Three phase induction motor: construction, rotating magnetic field, equivalent circuit, vector diagram, torque-speed characteristics, motor torque and developed rotor power, no-load test, blocked rotor test, starting and braking and speed control. Single phase induction motor: principle of operation, equivalent circuit and starting
Credit 3; Pre-requisite: EEE 201

EEE 302: Digital Logic Design

Review of binary number systems, Boolean algebra and simplification of Boolean functions. Logic Gates, combinational logic, Arithmetic and comperator circuits, Encoder and decoders. Multiplexers and Demultiplexers. Flip-flops, sequential logic, registers, counters. Programmable logic devices. Field programmable gate arrays, A/D, D/A converters. Transistor as a switch. Logic Family: RTL, DTL, TTL, ECL, MOS and CMOS logic : logic operations and brief descriptions, noise margins, propagation delays. Flip-flop and Memory design with BJT and CMOS. The course includes lab work based on theory taught.
Credit 3+1=4; Pre-requisite: EEE 102.

EEE 303: Signals and Systems

Continuous-time and discrete-time signals; commonly encountered signals; unit impulse and unit step functions; sampling and aliasing; continuous-time and discrete-time systems; basic properties.

Linear Time-Invariant (LTI) Systems: The convolution sum; the convolution integral; properties; difference and differential equations.

Fourier series representation of periodic signals: Continuous and discrete-time periodic signals; properties of continuous and discrete-time Fourier series; Fourier series and LTI systems.

Continuous-Time Fourier Transform: Properties; convolution and multiplication properties.

Discrete-Time Fourier Transform: Properties; convolution and multiplication properties.

Laplace Transform: Region of convergence; inverse Laplace transform; properties; analysis of LTI systems using the Laplace transform.

Z-Transform: Region of convergence; inverse z-transform; properties; analysis of LTI systems using the z-transform.
Credits: 3; Pre-requisite: EEE 201, MAT 301.

EEE 304: Electrical Machines II

DC generator: Operating principle, construction, classification, no-load voltage characteristics, build-up of a self excited shunt generator, critical field resistance, load-voltage characteristic, effect of speed on no-load and load characteristics and voltage regulation. DC motor: Operating principle, classification, torque, back emf, speed, torque-speed characteristics, starting and speed regulation. Synchronous Generator: excitation systems, equivalent circuit, vector diagrams at different loads, factors affecting voltage regulation, synchronous impedance, synchronous impedance method of predicting voltage regulation and its limitations. Parallel operation: necessary conditions, synchronizing, circulating current and vector diagram. Synchronous motor: Operation, effect of loading under different excitation condition, effect of changing excitation, V-curves.
The course includes lab work based on theory taught.
Credit: 3+1=4; Pre-requisite: EEE 301.

EEE 305: Electromagnetic Fields and Waves

Electrostatics: Review of Vector Analysis; Gauss's theorem and its application, electrostaic potential, Laplace's and Poisson's equations, method of images, energy of an electrostatic system, conductor and dielectrics.

Magnetostatics: Concept of magnetic field, Ampere's Law, Biot-Savart law, vector magnetic potential, energy of magnetostatic system, mechanical forces and torques in electric and magnetic fields, Curvilinear co-ordinates, rectangular, cylindrical and spherical co-ordinates, solutions to static field problems; Graphical field mapping with applications, solution to Laplace's equations, rectangular, cylindrical and spherical harmonics with applications.

Maxwell's equations: Their derivations, continuity of charges, concepts of displacement current. Boundary conditions for time-varying systems. Potentials used with varying charges and currents. Retarded potentials, Maxwell's equations in different coordinate systems.

Relation between circuit theory and field theory: Circuit concepts and the derivation from the field equations. High frequency circuit concepts, circuit radiation resistance. Skin effect and circuit impedance. Concept of good and perfect conductors and dielectrics. Current distribution in various types of conductors, depth of penetration, internal impedance, power loss, calculation of inductance and capacitance.

Propagation and reflection of electromagnetic waves in unbounded media: Plane wave propagation, polarization, power flow and Polyinting's theorem. Transmission line analogy, reflection from conducting and conducting dielectric boundary; Display lines ion in dielectrics, liquids and solids, plane wave propagation through the ionosphere. Introduction to radiation.
Credits: 3; Pre-requisite: MAT 102, PHY 102.

EEE 306: Power System Engineering

Line representation: Equivalent circuit of short, medium and long transmission line. Network representation: Single line and reactance diagram of power system and per unit representation. Load flow: Gauss-Seidel method. Power flow control: Tap changing transformer, phase shifting, booster and regulating transformer and shunt capacitor. Fault analysis: Short circuit current and reactance of a synchronous machine. Symmetrical fault calculation methods: symmetrical components, sequence networks and unsymmetrical fault calculation. Power system stability: swing equation, equal area criterion, methods of improving transient stability. Protection: Introduction to relays, differential protection and distance protection. Circuit breakers. Load curves: Demand factor, diversity factor, load duration curves, energy load curve, load factor, capacity factor and plant factor. The course includes lab work based on theory taught.
Credits: 3+1=4; Pre-requisite: EEE 201.

EEE 307: Telecommunications Engineering

Elements of communication systems, necessity of modulation, system limitations, message source, bandwidth requirements, transmission media types, bandwidth and transmission capacity. Noise: Source, characteristics of various types of noise and signal to noise ratio.

Amplitude Modulation and Demodulation: Double side band, single side band, vestigial side band. Spectral analysis of each type, envelope and synchronous detection; angle modulation instantaneous frequency, frequency modulation (FM) and phase modulation (PM), spectral analysis, demodulation of FM and PM.

Pulse modulation: Sampling - sampling theorem, Nyquist criterion. Pulse code modulation (PCM) - quantization principle, quantization noise, demodulation of PCM. Frequency and time division multiplexing and their applications. Radio Wave Propagation: Effects of ionosphere and earth's curvature. Introduction to Satellite and Optical Communication. Introduction to telephony: Different types of switching, SPC and digital switching systems, time and space switching.

The course includes lab work based on theory taught.
Credits: 3+1=4; Pre-requisite: EEE 303.

EEE 308: Electronic Properties of Materials

Crystal Structures: Types of crystals, lattice and basis, Bravais lattice and Miller indices.

Classical Theory of Electrical and Thermal Conduction: Scattering, mobility and resistivity, temperature dependence of metal resistivity, Mathiessen's rule, Hall effect and thermal conductivity.

Introduction to Quantum Mechanics: Wave nature of electrons, Schrödinger's equation, one-dimensional quantum problems - infinite quantum well, potential step and potential barrier; Heisenberg's uncertainty principle and quantum box.

Band Theory of Solids: Band theory from molecular orbital, Bloch theorem, Kronig-Penny model, effective mass, density-of-states.

Carrier Statistics: Maxwell-Boltzmann and Fermi-Dirac distributions, Fermi energy.

Modern Theory of Metals: Determination of Fermi energy and average energy of electrons, classical and quantum mechanical calculation of specific heat.

Dielectric Properties of Materials: Dielectric constant, polarization - electronic, ionic and orientational; internal field, Clausius-Mosotti equation, spontaneous polarization, frequency dependence of dielectric constant, dielectric loss and piezoelectricity.

Magnetic Properties of Materials: Magnetic moment, magnetization and relative permittivity, different types of magnetic materials, origin of ferromagnetism and magnetic domains.

Superconductivity: Zero resistance and Meissner effect, Type I and Type II superconductors and critical current density.
Credits: 3; Pre-requisite: PHY 102, MAT 301.

EEE 309: Digital Signal Processing

Introduction to Digital Signal Processing (DSP): Discrete-time signals and systems, analog to digital conversion, impulse response, finite impulse response (FIR) and infinite impulse response (IIR) of discrete-time systems, difference equation, convolution, transient and steady state response.

Discrete Transformations: Discrete Fourier series, discrete-time Fourier series, discrete Fourier transform (DFT) and properties, fast Fourier transform (FFT), inverse fast Fourier transform.

Z-transformation: Properties, transfer function, poles and zeros and inverse Z transform.

Correlation: Circular convolution, auto-correlation and cross correlation.

Digital Filters: FIR filters - linear phase filters, specifications, design using window, optimal and frequency sampling methods; IIR filters - specifications, design using impulse invariant, bi-linear z-transformation, least-square methods and finite precision effects.
Credits 3 Pre-requisite: EEE 303.

EEE 380: Digital Electronics

Diode logic gates, transistor switches, transistor gates, MOS gates, Logic Families: TTL, ECL, IIL, and CMOS logic with operational details. Propagation delay, product and noise immunity. Open collector and High impedance gates. Electronic circuits for Flip-Flops, counters and register. Memory system, PLAs and PLDs. A/D and D/A converters with applications. S/H circuits. LED. LCD and optically coupled oscillators. Non-linear applications of OP-AMPs. Analog switches. Linear wave shaping: diode wave shaping techniques, clipping and clamping circuits. Comparator circuits, switching circuits. Pulse transformers, pulse transmission. Pulse generator - monostable, bistable and astable multivibrators. Schmitt trigger. Blocking oscillators and time-base circuits. Timing circuits. Simple voltage sweeps, linear current sweeps. The course includes lab works based on theory taught.
Credits: 3+1=4; Prerequisite: EEE 109, EEE 251, CSE 255.

EEE 401: Microprocessors and Interfacing

Different types of microprocessors (8 bits and 16 bits). Instruction sets. Hardware organization. Microprocessor interfacing. Intel 8086 microprocessor: Architecture, addressing modes, instruction sets, assembly language programming, system design and interrupt.

Programmable peripheral interface, programmable timer, serial communication interface, programmable interrupt controller, direct memory access, keyboard and display interface: programmable keyboard and display controller. Introduction to micro-controllers.
The course includes lab work based on theory taught.
Credits: 3+1=4; Pre-requisite: EEE 102, CSE 105.

EEE 402: Control Systems

Linear System Models: Transfer function, block diagram and signal flow graph (SFG).

State Variables: SFG to state variables, transfer function to state variable and slate variable to transfer function.

Feedback Control System: Closed loop systems, parameter sensitivity, transient characteristics of control systems, effect of third pole and zero on the system response and system types and steady state error. Routh stability criterion. Root locus method and frequency response method.

Design of Feedback Control System: Controllability and observability, root locus, frequency response and state variable methods.

Digital Control Systems: Introduction, sampled data systems, stability analysis in Z-domain.Solving & analysis various problems by using Matlab.
The course includes lab work based on theory taught.
Credits: 3+1=4; Pre-requisite: EEE 303.

EEE 403: Semiconductor Devices

Energy Bands, Metals, Semiconductors, and Insulators. Direct and Indirect Semiconductor, Electrons and Holes, Effective Mass, intrinsic and extrinsic Materials.

The Fermi level, Electron and Hole Concentrations at Equilibrium, Charge Neutrality. Drift of carriers in electric fields: Conductivity and Mobility, Drift and Resistance

Diffusion of Carriers and Steady State Carrier Injection: Diffusion Processes, Diffusion and Drift of Carriers, Diffusion and Drift of Carriers, Built-in Fields Diffusion and Recombination, Steady State Carrier Injection; Diffusion Length.

P-N junctions in Equilibrium, Contact Potential: Fabrication of p-n Junctions, Equilibrium Condition, The Contact Potential, Equilibrium Fermi Levels , Space Charge at a Junction.

Current flow in a P-N Junction, Carrier Injection, the Diode Equation: Forward- and Reverse-Biased Junctions; Steady State Conditions Qualitative Description of Current Flow at a Junction; Carrier Injection.

Minority and Majority Carrier Currents and Reverse-bias Breakdown: Carrier Injection, Reverse Bias, Reverse-Bias Breakdown, Zener Breakdown, Avalanche Breakdown.

Stored Charges, Diffusion Capacitance and Junction Capacitance: Capacitance of p-n Junctions Metal semiconductor junctions: Schottky Barrier Rectifying Contacts, Ohmic Contacts, Typical Schottky Barriers, narrow-base diode.

Introduction to Bipolar Junction Transistor: BJT Fundamentals, common-emitter amplifier and small-signal circuit, Ebers Moll equation, Metal-insulator-semiconductor FET: Basic Operation, The Ideal MOS Capacitor, The Ideal MOS Capacitor, Effects of Real Surfaces (Flatband voltage), Threshold Voltage, MOS Capacitance-Voltage Analysis. MOS field-effect

Transistor: Output Characteristics, Transfer Characteristics; Mobility Model, Short Channel MOSFET I-V Characteristics, Control of Threshold Voltage; Small-signal analysis of CS-amplifier
Credits: 3; Pre-requisite: EEE 102, EEE 308.

EEE 411: Quantum Phenomena in Nano-Structures
Fundamentals of Quantum Mechanics: Concept of effective mass; bra-ket notations of state vectors; Schrödinger Equation; matrix formulation of quantum mechanics. Scattering Theory: Born approximation and partial wave analysis.

Approximation Methods: Different types of approximation methods including perturbation theory.

Fundamentals of Non-Equilibrium Statistical Mechanics: Scattering and relaxation.

Carrier transport: Density of states, tunneling and transmission probabilities; basic principles of tunnel diode, superlattice and quantum dot.
Credits: 3; Pre-requisites: EEE 403.

EEE 412: Theory of Semiconductor Devices
Lattice Vibration: Simple harmonic model, dispersion relation, acoustic and optical phonons. Band Structure: Isotropic and anisotropic crystals, band diagrams and effective masses of different semiconductors and alloys. Scattering theory: Review of classical theory, Fermi-Golden rule, scattering rates of different processes, scattering mechanisms in different semiconductors, mobility. Different Carrier Transport Models: Drift-diffusion theory, ambipolar transport, hydrodynamic model, Boltzmann transport equations, quantum mechanical model, simple applications.
Credits: 3; Pre-requisites: EEE 403.

EEE 413: Nanoscale Electronic Devices
Basic Concepts: 3D, 2D, 1D carriers, DOS, carrier densities, directed moments, quantized conductance, semiclassical carrier transport, ballistic transport (classical and quantum).

The MOSFET: MOS electrostatics: the MOS capacitor, MOSFET energy bands vs. bias, 2D electrostatics (the geometrical scaling factor).MOSFET current-voltage characteristics: General expression, linear region current, saturation region current (long channel), saturation region current (velocity saturated), full-range (above threshold and sub-threshold).

The bipolar transistor: Device structure I-V, MOSFET as a bipolar transistor.

CMOS technology: The CMOS inverter and digital gates, device, circuit and system, figures of merit, MOSFET scaling, systems considerations.

The Ballistic MOSFET: The mean-free paths and L, ballistic I-V (T>0 non-degenerate, T=0 degenerate, and T>0 general), numerical simulation of the ballistic MOSFET.

Scattering Theory of the MOSFET: I-V in terms of the transmission coefficient, the transmission coefficient (low V_{DS} and high V_{DS}), the mean-free path for backscattering, discussion.

Beyond the Silicon MOSFET (The Carbon Nanotube FET): Carbon nanotubes, band-structure basics, MIS electrostatics of carbon nanotube capacitors, theory of the ballistic CNTFET, CNTFETs vs. MOSFETs, discussion.
The course includes simulation type lab work based on theory taught.
Credits: 3+1=4; Prerequisite: EEE 403.

EEE 414: Optoelectronics
Properties of light: Particle and wave nature of light, polarization, interference, diffraction and blackbody radiation.

Optical Properties of Semiconductors: Direct and indirect band-gap materials, radiative and non-radiative recombination, optical absorption, photo generation of excess carriers, minority carrier life time, luminescence and quantum efficiency in radiation.

Light Emitting Diode (LED): Principles, materials for visible and infrared LED, internal and external efficiency, loss mechanism, structure and coupling to optical fibers.

Stimulated Emission and Light Amplification: Spontaneous and stimulated emission, Einstein relations, population inversion, absorption of radiation, optical feedback and threshold conditions.

Semiconductor Lasers: Population inversion in degenerate semiconductors, laser cavity, operating wavelength, threshold current density, power output, optical and electrical confinement. Introduction to quantum well lasers.

Photo-Detectors: Photoconductors, junction photo-detectors, PIN detectors, avalanche photodiodes and phototransistors.

Solar Cells: Solar energy and spectrum, silicon and schottky solar cells.

Modulation of light: Phase and amplitude modulation, electro-optic effect, acousto-optic effect and magento-optic devices. The course includes lab works based on the concepts introduced.
Credits: 3+1=4; Pre-requisites: EEE 403.

EEE 415: Semiconductor Processing and Fabrication
Substrate materials: Crystal growth and wafer preparation, epitaxial growth technique, molecular beam epitaxy, chemical vapor phase epitaxy and chemical vapor deposition (CVD). Doping techniques: Diffusion and ion implantation. Growth and deposition of dielectric layers: Thermal oxidation, CVD, plasma CVD, sputtering and silicon-nitride growth. Etching: Wet chemical etching, silicon and GaAs etching, anisotropic etching, selective etching, dry physical etching, ion beam etching, sputtering etching and reactive ion etching. Cleaning: Surface cleaning, organic cleaning and RCA cleaning. Lithography: Photo-reactive materials, pattern

generation, pattern transfer and metalization. Discrete device fabrication: Diode, transistor, resistor and capacitor. Integrated circuit fabrication: Isolation - pn junction isolation, mesa isolation and oxide isolation. BJT based microcircuits, p-channel and n-channel MOSFETs, complimentary MOSFETs and silicon on insulator devices. Testing, bonding and packaging.
Credits: 3; Pre-requisites: EEE 403.

EEE 416: VLSI Circuits and Systems
VLSI Technology: Top down design approach, technology trends and design styles.

Review of MOS Transistor Theory: Threshold voltage, body effect, I-V equations and characteristics, latch-up problems. NMOS and CMOS inverter, pass-transistor and transmission gates. CMOS Circuit Characteristics and Performance Estimation: Resistance, capacitance, rise and fall times, delay, gate transistor sizing and power consumption. CMOS Circuit and Logic Design: Layout design rules and physical design of simple logic gates.

CMOS Building Blocks: adders, counters, multipliers, memory structure, arithmetic logic unit. Programmable logic arrays. I/O systems.

VLSI Testing: objectives and strategies. The course includes lab works based on the concepts introduced.
Credits: 3+1=4; Pre-requisites: EEE 403.

EEE 417: Power Electronics
Power Semiconductor Switches and Triggering Devices: BJT, MOSFET, SCR, IGBT, GTO, TRIAC, UJT and DIAC. Rectifiers: Uncontrolled and controlled single phase and three phase. Regulated Power Supplies: Linear-series and shunt, switching buck, buck boost, boost and Cuk regulators.
AC Voltage Controllers: single and three phase. Choppers. DC motor control. Single phase cycloconverter.

Inverters: Single phase and three phase voltage and current source. AC motor control. Stepper motor control. Resonance inverters. Pulse width modulation control of static converters. The course includes lab works based on the concepts introduced.
Credits: 3+1=4; Pre-requisites: EEE 202, EEE 403.

EEE 418: Analog Integrated Circuits
Review of FET Amplifiers: active and passive loads and frequency limitation.

Current Mirror: Basic, cascade and active current mirror.

Differential Amplifier: Introduction, large and small signal analysis, common mode analysis and differential amplifier with active load.

Noise: Introduction to noise, types, representation in circuits, noise in single stage and differential amplifiers and bandwidth. Band-Gap References: Supply voltage independent biasing, temperature independent biasing, proportional to absolute temperature current generation and constant transconductance biasing.

Switch Capacitor Circuits: Sampling switches, switched capacitor circuits including unity gain buffer, amplifier and integrator. Phase Locked Loop (PLL): Introduction, basic PLL and charge pumped PLL. The course includes lab works based on the concepts introduced.
Credits: 3+1=4; Pre-requisites: EEE 403.

EEE 419: Biomedical Electronics
The human body; an overview, forms of mammalian cells, bioelectricity; Electro conduction system of the heart; Bio-electric amplifiers; carrier amplifiers; optically coupled amplifiers; current loading type isolation amplifiers; chopper amplifiers; differential chopper amplifiers, Electrocardiograph (ECG) waveform; ECG preamplifiers, defibrillator, blood pressure measurements and electronic manometry pressure transducers, pressure amplifiers, systolic, diastolic and mean director circuits, practical problems in pressure monitoring; Blood flow measurements; plethysmography, vector cardiography, cardioverter and pacemakers; Measurement of human brain parameters; cerebral angiography, cronical X-ray, brain scans; Tomography and ultra sonogram; Electroencephalography (EEG); electrode, frequency bands, EEG patterns and EEG preamplifiers, ICU/ CCU central monitoring system.
Credits: 3; Pre-requisites: EEE 202, EEE 204.

EEE 421: RF and Microwave Engineering
Transmission lines: Voltage and current in ideal transmission lines, reflection, transmission, standing wave, impedance transformation, Smith chart, impedance matching and lossy transmission lines. Waveguides: general formulation, modes of propagation and losses in parallel plate, rectangular and circular waveguides. Micro strips: Structures and characteristics. Rectangular resonant cavities: Energy storage, losses and Q.
Radiation and Antenna: Small current element, radiation resistance, radiation pattern and properties, Hertzian and halfwave dipoles. Antennas: Mono pole, horn, rhombic and parabolic reflector, array, and Yagi-Uda antenna.
The course includes lab works based on the concepts introduced.
Credits: 3+1=4; Pre-requisites: EEE 305, EEE 307.

EEE 422: Digital Communications
Introduction to Communication channel - Communication channels, mathematical model and characteristics; Probability and stochastic processes.
Source coding: Mathematical models of information, entropy Huffman code and linear predictive coding. Scrambling/descrambling; Multiplexing techniques; Additive white Gaussian noise (AWGN); Detection techniques for baseband digital signals corrupted by AWGN; Eye diagrams and intersymbol interference (ISI); Bit error performance of base band digital signals in presence of AWGN and ISI; Error control coding schemes; Description of M-ary digital modulation systems (PSK, MSK, QAM); Symbol error performances in the presence of AWGN and ISI and co-channel

interference (CCI); Power spectral analyses; Bandwidth requirements and timing recovery circuits; Reliability objectives; System gain; Fade margin requirements for a specific system availability; Design guidelines; Transparent and regenerative transponders; Single channel per carrier (SCPC) systems; Frequency division multiple access (FDMA); Time division multiple access (TDMA) systems; Link budget.

The course includes lab works based on the concepts introduced.

Credits: 3+1=4; Pre-requisites: EEE 202, EEE 307.

EEE 423: Wireless and Mobile Communications

Concept, evolution and fundamentals of wireless and mobile communications; analog and digital cellular systems.

Cellular Radio System: Frequency reuse, co-channel interference, cell splitting and components.

Mobile radio propagation: Propagation characteristics, models for radio propagation, antenna at cell site and mobile antenna.

Frequency Management and Channel Assignment: Fundamentals, spectrum utilization, fundamentals of channel assignment, fixed channel assignment, non-fixed channel assignment, traffic and channel assignment.

Handoffs and Dropped Calls: Reasons and types, forced handoffs, mobile assisted handoffs and dropped call rate.

Diversity Techniques: Concept of diversity branch and signal paths, carrier to noise and carrier to interference ratio performance.

Digital cellular systems: Global system for mobile, time division multiple access and code division multiple access; Mobile propagation; Channel modeling; Principles of cellular communications systems; Multiple access techniques; Pan-European digital cellular mobile system (GSM): radio aspects, network aspects; GPRS, HSCSD and EDGE; UMTS/IMT2000: radio aspects, network aspects. The course includes lab works based on the concepts introduced.

Credits: 3+1=4; Pre-requisites: EEE 202, EEE 307.

EEE 424: Fiber Optics

Theory of Light Propagation: Ray optics theory and mode theory.

Optical Fiber: Types and characteristics, transmission characteristics, fiber joints and fiber couplers. Light Sources: Light emitting diodes and laser diodes.

Detectors: PIN photo-detector and avalanche photo-detectors.

Receiver Analysis: Direct detection and coherent detection, noise and limitations.

Transmission Limitations: Chromatic dispersion, nonlinear refraction, four wave mixing and laser phase noises.

Optical Amplifier: Laser and fiber amplifiers, applications and limitations.

Multi-Channel Optical System: Frequency division multiplexing, wavelength division multiplexing and co-channel interference. The course includes lab works based on the concepts introduced.

Credits: 3+1=4; Pre-requisites: EEE 202, EEE 307.

EEE 425: Digital Image Processing

Digital image fundamentals: image digitization, sampling and quantization, image resolution, color perception and processing, image processing: pixel based information, geometric transformation, local processing (edge detection, subpixed location estimation) restoration (degradation, inverse fitting and weiner filtering), binary image processing: thesholding, runlength encoding, distance transforms, medical axis transforms, morphological operations, region segmentation and representation: split and mere algorithm, region growing, image filtering- histogram modification, linear and Gaussian filters, contours- digital curves, polyline splitting, Hop- along algorithm, Conic and Splines Hough transform, Fourier description, textures: statistical syntactic and model based methods, image transforms-Fourier, Hadamard, discrete cosine, wavelets and other orthogonal transforms, compression image (predictive compression methods, vector quantization, hierarchical and progressive methods, JPEG and MPEG), case studies. The course includes lab works based on the concepts introduced.

Credits: 3+1=4; Pre-requisites: EEE 309.

EEE 431: Advanced Logic Design

Introduction. Combinational circuit design with programmable logic devices, implementation of high speed multipliers. Design of modular sequential logic circuits, implementation of digital fractional rate multipliers. State machine design, Mealy and Moore machines. Asynchronous circuit design. Design, modeling and verification of complex digital systems. Modem design methodologies for logic design: Data path and control design, algorithmic state machines integration of data and control. Logic circuit testing and testable design. Modern tools for the design and testing of digital systems. Digital design case studies.

Credits: 3; Pre-requisites: EEE 302.

EEE 432: Microprocessor Based System Design

Limitations of 16 bit processors. 32 bit microprocessors (Intel 80386/80486, Motorola 68000) internal architecture, addressing modes, instructions, memory and I/O interfaces, system design, programming, applications to industrial process control. Embedded processors architecture advanced port, programming, controller design for adjustable speed motor devices.

The course includes lab works based on the concepts introduced.

Credits: 3+1=4; Pre-requisites: EEE 401.

EEE 433: Computer Networks

Introduction: What is the Internet, What is a protocol? The Network Edge, Core, and Access, Networks Physical Media Delay and Loss in Packet-Switched Networks

,Protocol Layers and Their Service Models, Internet Backbones, NAPs and ISPs , A Brief History of Computer Networking and the Internet

The Application Layer: Principles of Application-Layer Protocols, The World Wide Web: HTTP ,File Transfer: FTP, Electronic Mail in the Internet, The Internet's Directory Service: DNS, Socket Programming.

The Transport Layer: Transport-Layer Services and Principles ,Multiplexing and Demultiplexing Applications, Connectionless Transport: UDP, Principles of Reliable of Data Transfer, TCP case study , Principles of Congestion Control, TCP Congestion Control.

The Network Layer : Introduction and Network Service Model, Routing Principles ,Hierarchical Routing.

IP: The Internet Protocol, routing in the Internet, What is Inside a Router, Mobile networking.

The Link Layer and Local Area Networks: The Data Link Layer: Introduction, Services Error Detection and Correction, Multiple Access Protocols and LANs, LAN Addresses and ARP, Ethernet Hubs, Bridges and Switches, Wireless LANs: IEEE 802.11, PPP: the Point-to-Point Protocol, ATM.

Security in Computer Networks: What is Network Security, Principles of Cryptography Authentication, Integrity, Key Distribution and Certification, Firewalls, Attacks and Countermeasures.

Protocols: Mechanisms. What protocol mechanisms/techniques are commonly found in networks (particularly Internet) protocols and why are they used? signaling, randomization, indirection, multiplexing, virtualization, scalability.

Introduction to Queuing: M/M/1; closed loop system models; packet versus fluid models; bounding techniques (e.g., Chernoff bound); normal distributions (equivalent bandwidth), network calculus

Measurement. Workload models; traffic and topology characterization, analysis (LRD, heavy tails)

The course includes lab works based on the concepts introduced. The course includes lab work based on theory taught.
Credits: 3+1=4; Pre-requisite: CSE 105.

EEE 434: Computer Architecture
Information representation and transfer, instruction and data access methods, the control unit: hardwired and micro programmed, memory organization, I/O systems, channels, interrupts, DMA, Von Neumann SISD organization, RISC and CISC machines.
Pipelined machines, interleaved memory system, caches, Hardware and architectural issues of parallel machines, Array processors, associative processors, multiprocessors, systolic processors, data flow computers and interconnection networks, High level language concept of computer architecture.
The course includes lab works based on the concepts introduced.
Credits: 3+1=4; Pre-requisites: EEE 302.

EEE 441: Power Stations
Estimates of load, load curves, study and analysis of load curves, interpretation of load curves. Determination of actual demand and capacity of various components in a system, plotting the expected load curve of a system. Use of the load curve. Load growth and extrapolation of load curves. Selection of service requirements, its effect on plant design. Cost consideration. Equations of performance for plant equipment and electric service.

Selection of units, standby units, large or small units. Number and sizes of units. Plant location. Considerations for site selection for different types of plants. Generation considerations for different types of power plants-big, medium and small, conventional and nuclear. Economic marginal transmission cost. Graphical solution for location of different types of distribution. Rectangular distribution of loads. Economic conductor section. General consideration.

The ideal conductor. Effect of any deviation from the ideal cross section. Limits. for size of underground cables. Selection of ideal supply voltage. Plant performance and operation characteristics. Performance characteristics. Efficiency. Heat rate. Incremental rate method. Station performance characteristic. Station incremental rate. Capacity scheduling. Base load and peak load. Load division between steam and hydro stations. Bus systems, Importance of power control. Current limiting reactors. Different types of bus system layout. Forces on buses in case of short circuits. Nuclear power stations. Comparison with conventional generation methods. Chain reactors. Moderators. Classification of reactors. Types of reactors. Special power reactors. Shielding.
Credits: 3; Pre-requisites: EEE 306.

EEE 442: Switchgear and Protective Relays
Circuit breakers; speed of circuit breakers. Relays Voltage rating (high, medium, lower, low) of circuit breakers. Oil circuit breakers. Circuit breaker operating mechanism and control systems. Arc extinction. Recovery voltage. Devices to aid are extinction in oil. Maintenance of oil circuit breakers, minimum oil circuit breakers. Air circuit breakers, air blast circuit breakers, vacuum circuit breakers, SF6 circuit breakers.

Ratings of power circuit breakers and selection of circuit breakers. Testing of circuit breakers. Protective Relays: General requirements. Relay operating principles. Construction of relays. Relay currents and voltages; use of instruments transformer for relays.

Problems of high speed relaying of transmission lines. Overcorrect relays. Directional relays. Distance relays. Sequence and negative sequence relays. Balanced current relaying of parallel line. Ground fault relaying. Pilot relaying principles. Carrier pilot relaying. Operating characteristics of different types of relays. Apparatus protection; circuits and relay setting. Generator motor protection; Transformer protection. Bus protection; line protection.
Credits 3; Pre-requisites: EEE 201.

EEE 443: Special Machines

Generalized energy conversion processes, general principles of electromechanical energy conversion, energy storage. Interpretation of generalized machines from field concepts. Linear induction motor, stepper motor, universal motor, electrostatic motor, repulsion motor, permanent magnet motor, shaded pole motor, hysteresis motor, synchronous reluctance and switched reluctance motor, amplidynes and metadynes, synchronous. Introduction to vector control of induction motors. Introduction to electric traction.
Credits: 3; Pre-requisites: EEE 304.

EEE 444: High Voltage Engineering

High voltage dc: rectifier circuits, voltage multipliers, Van-de-Graff generators, electrostatic generators. High voltage ac: cascaded transformers and Tesla coil. Impulse voltage: shapes, mathematical analysis, single and multi stage impulse generators, tripping and control of impulse generators. Breakdown in gas, liquid and solid dielectrics. High voltage measurements and testing. Over voltage phenomena and insulation co ordination: lightning and switching surges, basic insulation level, surge diverters, arresters, protector tubes and metal oxide varistors. The course includes lab works based on the concepts introduced.
Credits: 3+1=4; Pre-requisites: EEE 306.

EEE 445: Renewable Energy

Importance of renewable energy, sources; Statistics regarding solar radiation and wind speed; Insulation; geographical distribution, atmospheric factors, measurements; Solar cell; principle of operation, spectral response, factors affecting conversion efficiency, I_V characteristics, maximum power output; PV modules and arrays; stationary and tracking; PV systems; stand alone, battery storage, inverter interfaces with grid; Wind turbine generators; types; operational characteristics; cut-in and cut-out speed, control, grid interfacings, AC-DC -AC link.
Credits: 3; Pre-requisites: EEE 102.

EEE 446: Power System Operation and Reliability

Introduction to unit commitment, contingency evaluation and security assessment; Automatic generation control; Reliability concepts; general reliability functions, exponential distribution, mean time to failure, series- parallel systems, Markov's process; Generation model; Load model; Reliability evaluation of a power system; LOLP, LOEP.
Credits: 3; Pre-requisites: MAT 102, EEE 306.

EEE 452: Electrical Technology

Single-phase transformer - equivalent circuits. Three-phase transformers. D.C. generator and motor: operation and characteristics. 3-phase induction motors: types, operations, equivalent circuit, characteristics, starting. Introduction to 3-phase alternators and synchronous motors. Fractional horsepower motors. The course includes lab works based on theory taught.
Credits : 3; Prerequisite :EEE 109

EEE 490: VLSI Design

Introduction to microelectronics and MOS technology, Basic electrical properties and circuit design process of MOS and CMOS circuits, Scaling of MOS circuits, Subsystem design process and layout. Computational elements: Design of an ALU subsystem, Adder, Multipliers, Memory, Registers, and aspects of system timing. Practical aspects of design tools and testability, CMOS design: behavioral description, structural description, physical description and design verification, Introduction to GaAs technology: Ultra-fast VLSI circuits and systems.
Credits: 3; Prerequisite: EEE 109, EEE 251, CSE 255, EEE 380.

ENG 099: Remedial English

This is a remedial English program intended for students facing difficulties in coping with English as a medium of interaction. The course incorporates components of the basic language skills: Listening, Speaking, Reading and Writing. Problems such as grammatical, structural and appropriateness problems, along with other types of mistakes students make, will be addressed through reading, writing and speaking.
Credits: None, Prerequisite: none

ENG 100: Improving Oral Communication Skills (compulsory)

This course is meant to provide extensive practice in oral expression to cater for students' needs of Oral Communication in practical life. The course will focus on both accuracy and fluency and provide practice in functional and situational English. It will train students for seminar presentation, extempore speech, debate, and facing and taking interviews along with a number of notions and functions of oral communication skills.
Credits: 3, Prerequisite: None

ENG 101: Basic English

The course seeks to provide training in the four basic skills of English. It also includes contextual grammar, but addressed basically through reading and writing. The grammatical components will cover most of the grammatical items but in an integrative and holistic way and will be addressed basically through reading, writing, and speaking, with meaning-focused activities.
Credits: 3, Prerequisite: ENG 099 for students who are required to do ENG 099, (no pre-requisite for English department students, and students who are not required to do ENG 099)

ENG 102: Composition and Communication Skills

The course stresses on developing writing skills. The components of the course are writing reports, essays of different types (mainly expository, argumentative, narrative, and descriptive) formal letters (letters in academic settings, job applications, CVs), summary writing, and writing Assignments,Term/Research Papers with bibliography, footnotes and index. It also stresses on correction of spelling, grammar and usage.
Credits: 3, Prerequisite: ENG 101

ENG 145: Introduction to Linguistics

The aim of this course is to familiarize students with some basic concepts of Linguistics. The course components are aspects of human language, phonetics & phonology, morphology, syntax, semantics, language & society, language change, brain & language etc.
Credits: 3, Prerequisite: None

ENG 154: English Phonetics and Phonology

The aim of this course is to prepare students to speak English with acceptable pronunciation and intonation. It includes the description of English consonant and vowel sounds, Phonemic Transcription, Stress Patterns and different functions of intonation.
Credits 3, Prerequisite: ENG 145

ENG 155: Improving Reading and Writing Skills

This course aims at providing extensive practice in reading and writing skills. It is felt that students need help with extensive, intensive, close and critical reading and with writing coherent and cohesive essays and assignments. The reading component of the course will focus on such aspects as guessing of meaning from context, inferential skills, interpretative skills, and skills for critical evaluation. The writing part will focus on free writing, organizational skills - using linkers, discourse markers, pronoun referencing, subject-verb agreement, drafting, editing and improving drafts.
Credits 3, Prerequisite: ENG 102

ENG 191: Introduction to Literature: Fiction and Non-Fiction Prose

This course introduces students to the major genres of literature such as short and long fiction and non-fiction prose with a view to introducing students to the forms and styles of these genres of literature. It will cover the following literary texts/pieces :
Non-Fiction Prose:
Desmond Morris: "Altruistic Behaviour"
Virginia Woolf: "Professions for Women"
George Orwell: "Shooting an Elephant"
Short Fiction: Katherine Mansfield: "The Garden Party"
Hemingway: "Killers"
Novel: R.K. Narayan: The Guide

ENG 192: Introduction to Literature: Poetry and Drama

This course aims at familiarizing students with two major genres of literature, Poetry and Drama.
It covers different elements/aspects of poetry and drama such as language use in poetry, differences between prose and poetry, poetic diction, figures of speech, sound effects in poetry, different types of drama (tragedy, comedy, tragi-comedy, history, melodrama etc,), elements of drama (dialogue, action, conflict, dramatic irony, plot construction etc).
Prescribed Texts
Poems: Andrew Marvell: "To His Coy Mistress"
John Milton: "On His Blindness"
P.B. Shelly: "Ozymandias"

Robert Browning: "Meeting at Night"
Robert Frost: "Stopping by Woods on a Snowy Evening"
Drama: J. M. Synge: The Riders to the Sea
Credits 3, Prerequisite: None

ENG 200: Advanced Verbal Communication Skills

This course is meant to give students further training in oral communication skills but with special emphasis on appropriate use of language and style, formal and informal style, polite and impolite expressions, tone, intonation, and stress. It will also cover facing and conducting interviews, presenting seminar papers, and project proposals, conducting and taking part in formal meetings, talking and negotiating business/and official matters.

ENG 201: Theories of Writing

The course familiarizes students with current theories of writing. It offers a perspective on the writing profession's theoretical evolution - process to cohesion to cognition to social construction. Students will be asked to apply the theories learnt to their own practices.
Credits 3; Prerequisite: ENG 309

ENG 205: History of the English Language

The purpose of this course is to introduce students to the major developments in English language. It includes salient features of Old, Middle and Modern English. It also incorporates a comparison between British and American English, as well as a comparison among some non-native varieties of English such as Indian and African varieties.
Credits 3, Prerequisite: ENG 145

ENG 207: Psycholinguistics

This course emphasizes the psychological aspects of language learning. It incorporates Child Language Acquisition, Sound System, Phonology, Syntax, Semantics, Interlanguage Theory, Universal Grammar Theory and Cognitive Theory.
Credits 3, Prerequisite: ENG 145

ENG 208: Sociolinguistics

The aim of this course is to familiarize students with various aspects of Sociolinguistics. The course includes language varieties and standardization, regional and social dialects, geographical distribution and characteristics of pidgins and creoles, bilingualism, code switching/mixing and sociocultural aspects of multilingualism.
Credits 3, Prerequisite: ENG 145

ENG 209: Political and Social History of England

This course introduces students to the major social and political events of England and also of Europe from the Tudor period to the end of 20th Century and the different literary movements active during these period.

ENG 226: Business and Professional Writing

This course aims at training students to write different types of business letters and professional writings. It will include writing reports, letter of complaints, ordering goods, preparing business contract papers, advertisements. The course will also include writing project proposals, notice for meetings, minutes of meetings, tenders, advertisements, inter-office correspondence, notes, memos etc.

ENG 230: Nineteenth Century Novel

This course includes the major novelists of the time and their representative works.
Prescribed Texts
Emile Bronte: *Wuthering Heights*
Jane Austen : *Pride and Prejudice*
George Eliot: *Mill on the Floss*
Charles Dickens : *Great Expectations*
Thomas Hardy : *Tess of the D'Urbervilles*
Credits 3, Prerequisite: ENG 191

ENG 235: Teaching Language through Literature.

The purpose of this course is to familiarize students with some techniques of using literature for language skills training. The course will discuss some of the ideas both for and against the use of literature in language teaching, and how literature might prove an effective tool for training listening, speaking, reading and writing skills of English.
Credits 3, Prerequisite: ENG 145, +ENG 306

ENG 245: Romantic Poetry

The course includes selections from the Romantic poets and authors will include Wordsworth, Coleridge, Shelley, Keats and Byron.
Prescribed Texts
Wordsworth : "Tintern Abbey "
"Ode on the Intimations of Immortality"
"London 1802", "The World is too much with Us"
"Three years She Grew in Sun and Shower"
Coleridge: "The Rime of the Ancient Mariner" "Kubla Khan"
PB Shelly: "Ode to the West Wind", "To a Skylark", "Adonais"
Keats: "Ode to a Nightingale", "Ode on a Grecian Urn", "Ode to Autumn", "Ode to Melancholy", "On First Looking into Chapman's Homer"
Byron: "Manfred"
Credit 3, Prerequisite: ENG 192

ENG 301: Elizabethan and Restoration Drama

Students will not only read plays from the two periods but will gain a perspective on the historical, religious and political background of the ages. Texts will include selections from Thomas Kyd, Christopher Marlowe, William Shakespeare, Ben Jonson, and William Congreve. Prescribed Texts
Thomas Kyd: *The Spanish Tragedy*
Marlowe: *Doctor Faustus*
Shakespeare: *As You Like It*
Ben Jonson: *The Alchemist*
Congrave: *The Way of the World*
Goldsmith: *She Stoops to Conquer*
Credits 3, Prerequisite: ENG 192

ENG 303: Syllabus and Material Design

The purpose of this course is to introduce students to different types of syllabus such as grammatical syllabus, structural syllabus, notional-functional syllabus, and communicative syllabus. It introduces students to some of the fundamental considerations of syllabus design such as needs analysis, setting of goals, defining objectives, deciding about pedagogic approaches, selecting, grading and sequencing of items, and recommending testing procedures. The course also covers the basic considerations in selecting, adopting, and designing materials.

Some of the checklists will be consulted for evaluation and a unit of materials will be evaluated. The course will also include lesson planning and task design.
Credits 3, Prerequisite: ENG 145 + ENG 306

ENG 305: Linguistic Theories

The course discusses the historical developments of Linguistics as a discipline. The course incorporates theories of Saussure, the descriptivists, the Sapir Whorf hypothesis, Functional Linguistics of Prague School, Noam Chomsky and Generative Grammar and the London School.
Credits 3, Prerequisite: ENG 145 + ENG 154

ENG 306: Methodology of Language Teaching

The aim of this course is to prepare students as good language teachers by familiarizing them with theoretical and practical aspects of language teaching. The course emphasizes the importance of methodology in language teaching. It critically examines Audiolingual Method, Communicative Method, The Natural Approach, Total Physical Response and Suggestopedia.
Credits 3, Prerequisite: ENG 145

ENG 307: Academic Writing

This course is designed to help and guide students to write well-developed academic papers for their courses following the processes and conventions of academia. Practice of critical reading and critical thinking will be emphasized. Students will learn how to write a good academic paper with a good introduction and conclusion through the process of paraphrasing, incorporating and synthesizing ideas, and selecting and using quotations from various primary and secondary sources of their readings. Building self-confidence as an original thinker and avoiding plagiarism will be also a component part of the course. The course will also acquaint students with current APA and MLA citation practices.
Credits 3; Pre-requisite: ENG 155 +ENG 309

ENG 309: Advanced Reading and Writing

Students will be required to study selected literary pieces in order to develop an awareness of the linguistic devices an author employs and the effects they produce. Students will explore different rhetorical modes including narration, description, process, comparison/contrast, classification, cause and effect. The course will also focus

on word choice, sentence variety and organization of ideas. Reading will cover such areas as critical reading, finding explicit and implicit relationships between elements of texts, identifying author's attitude and feelings, mood and tone, recognizing bias, interpreting and critically evaluating texts. Writing will focus on style of writing, introducing point of view, using the writer's tone, conventions of referencing and quoting.
Credits 3, Prerequisite: ENG 155

ENG 310: Shakespeare
The course aims to familiarize students with Shakespeare's craft, technique, use of language and with the rudiments of Shakespearean stage structure through the reading of Shakespearean plays and poetry. Texts will include a mixture of Shakespearean tragedy, comedy, history plays, the problem plays and selected sonnets.
Prescribed Texts
Macbeth, Richard II
Julius Caesar
The Twelfth Night
Five Selected Sonnets
Credits 3, Prerequisite: ENG 301 + at least 8 other courses

ENG 313: English for the Media
This paper seeks to train students in journalistic writings such as short news reports with catchy captions/headings, subtitling, translating reports obtained from foreign news agencies, preparing long reports for the press or electronic media, writing special features for the media, and editing. It will focus on both objective reporting or distancing the self from the report and subjective reporting or taking a position while reporting. The course will train students to take active parts in press briefing/conferences and prepare reports on the briefings, interview persons, conduct surveys and prepare reports for the media. The course will give training in the art of newscasting with emphasis on pronunciation, stress, intonation, confidence, and naturalness.
Credits 3, Prerequisite: ENG 102

ENG 315: Seventeenth and Eighteenth Century Poetry
This course includes the major poets of this period.
Prescribed Texts
Milton: *Paradise Lost Bk. I*
Donne: "Good Morrow"
"A Valediction forbidding Mourning"
"Twickenam Garden"
"Extasie", "Canonization"
Dryden : *Absalom and Achitophel*
Pope: *Rape of the Lock*
Grey: "Elegy Written in a Country Churchyard"
Blake: Selection from *Songs of Innocence and Songs of Experience*
Credits 3, Prerequisite: ENG 192

ENG 316: English for Specific Purposes
This course aims at introducing students to teaching English for specific purposes such as English for academic purposes, occupational purposes, Engineering, English for business studies etc., so that they can develop themselves as good ESP teachers.
Credits 3, Prerequisite: ENG 303 + ENG 306

ENG 319: Translation Studies
This course introduces students to the methods and mechanism of translation from vernacular to foreign language or vice versa. This is mostly a practice-based course and so students will be required to choose a book for translation over the semester. A teacher will be closely monitoring their progress and providing guidance. Some relevant reading articles will also be selected for their theoretical grounding so that they can have theoretical knowledge underpinning the translation as a skill.
Credits 3, Prerequisite: ENG 155 + ENG 309 + at least 5 literature courses

ENG 320: Victorian Prose and Poetry
The course seeks to show the changes taking place in society. It consists of novels and poems of the era. Writers include Newman, Robert Browning, Tennyson and Mathew Arnold.
Prescribed Texts
Prose: Newman: *The Idea of a University*, Chapters V, VI, and VII
Arnold: *Culture and Anarchy*, Chapters I & II
Poetry: Tennyson: " Tithonus"
"The Lady of Shallot"
"Tears, Idle Tears"
"The Lotos Eaters"
Selections from "*In Memoriam*"
 Browning: "Love Among the Ruins "
"Fra Lippo Lippi"
"The Last Ride Together"
" My Last Duchess"
Arnold: "Dover Beach"
 "The Scholar Gypsy"
"Thyrsis "
Credits 3, Prerequisite: ENG 191, 192 + ENG 245

ENG 330: English Prose from Bacon to Lamb
The course consists of prose writings from the Elizabethan to the Nineteenth Century. It includes selected writings of Bacon, Addison and Steele, Swift, Boswell and Lamb
Prescribed Text
Bacon: "Of Studies", " Of Great Place",
 "Of Truth", "Of Friendship"
Addison and Steele: Selections from the *Spectator*
Boswell's *Life of Dr. Johnson*
Swift: "A Modest Proposal"
Charles Lamb: Selections from *Essays of Elia*
Credits 3, Prerequisite: ENG 191

ENG 340: Eighteenth Century Fiction

Students will focus on the rise of the novel and discuss the major works of prose fiction of the period. The texts to be studied include *Robinson Crusoe, Gulliver's Travels, Joseph Andrews, Tom Jones and Rasselas*
Credits:3, Prerequisite: ENG 191

ENG 402: Pragmatics & Discourse Analysis

This course introduces students to speech act theory, conversational maxims, relevance and implicature, communicative events, modality, cohesion, coherence, frames, presupposition and the pragmatics of politeness, topic change, turn taking, interruptions, conversation structure, clarification, repair, face saving and solidarity. It will also focus on spoken and written discourse analysis, contrastive pragmatics, anthropological perspective and cross-cultural communication. By the end of the course it is expected that students will be able to critically analyze spoken interaction and to evaluate written texts with particular reference to context, cohesive ties, topic framework, illocution and inference.
Credits 3, Prerequisite: ENG 145 + ENG 154

ENG 403: Modern Novels

Students will read a number of English novels of the post World War II era. Writers include D.H. Lawrence, William Golding, George Orwell, Virginia Woolf, James Joyce and Joseph Conrad
Prescribed Texts
D H Lawrence :   *Sons and Lovers*
William Golding: *Lord of the Flies*
George Orwell: *Animal Farm*
Verginia Woolf : *Mrs. Dalloway*
James Joyce: *Portrait of the Artist as a Young Man*
Joseph Conrad: *Heart of Darkness*
Credits 3, Prerequisite: ENG 230

ENG 405: Creative Writing:

This is an introductory course on writing poetry and short fiction. The course will give students the opportunity to explore how poetry and short stories can express ideas and emotions and transform the mundane and commonplace into works of art. Keeping in mind the tensions between aesthetic and communicative values of words and the demands of finding one's voice, students will discover the surprises, challenges and the pleasures that lie hidden behind all creative work of art shaped by language. Students will read some selected models of poetry and short story, but will be encouraged to be creative.
Credits 3, Prerequisite 155 and 309

ENG 410: Continental Literature

The course aims at familiarizing students with some major writers of Continental Literature. It includes works of Flaubert , Tolstoy, Brecht, Pirendello, Baudelaire and Rilke.
Credits 3, Prerequisite: None

ENG 411: Language Acquisition Theories in EFL/ESL Contexts

This course introduces students to the different theories of language acquisition, and to interlanguage, universal linguistics, and error analysis theories, and examines their relevance in teaching English in foreign/second language contexts.
Credits 3, Prerequisite: ENG 207

ENG 412: Techniques of Teaching English Language Skills

This course aims at familiarizing students with different techniques of teaching listening, speaking, reading and writing skills to help develop their efficiency in teaching these English language skills. The course will require the students to also do practice teaching.
Credits 3, Prerequisite: ENG 145 + ENG 207 + ENG 306

ENG 413: Language Testing and Evaluation

This course introduces students to the different types of language tests - placement, diagnostic, proficiency, achievement, norm-referenced and criterion referenced tests. It also discusses some fundamental considerations in language testing such as reliability, validity, (face validity, content validity, construct validity etc.), and administrability. It trains students to evaluate the tests and design reading, writing, speaking and listening tests.
Credits 3, Prerequisite: ENG 145 + ENG 207 + ENG 306

ENG 414: Research Methodology in ELT

This is an advanced course that aims at introducing students to the approaches and methods of ELT research so that they can understand the problems of English language teaching in Bangladesh and recommend some solutions to those problems. It introduces students to the different areas and different types of ELT research such as qualitative research, quantitative research, experimental research, case studies and action research. It talks about setting a research program, doing literature review, designing research tools which includes tools for questionnaire survey for interviews and classroom observation, data processing and analysis, and presenting the result. It also introduces students to statistical concepts such as central tendency (mean, median, mode), distribution (standard deviation, normal distribution curve etc).
Credits 3, Prerequisite: ENG 145 +ENG 207 + ENG 303 + ENG 306 & ENG 235

ENG 415: Language Policy and Planning

The purpose of this course is to introduce students to some important issues and considerations in language policy and planning. It considers the nature and function of 'official' languages and the relationships between languages and identity and the pluralism - assimilation issue. Students will have to study the language policies of some other countries, examine the language policy of Bangladesh and come up with new ideas for planning an effective language policy for Bangladesh.
Credits 3, Prerequisite: ENG 208

ENG 417: Problems & Prospects of ELT in Bangladesh

This course provides an overview of the present state of ELT in Bangladesh and seeks to help students find out the means to resolve its problems. It closely examines classroom methodology, curriculum and testing across primary, secondary and higher secondary levels of English teaching and learning. Students will also be made familiar with some ELT projects like PERC, ELTIP and the American Peace Core initiative for the improvement of English language teaching and learning in Bangladesh.
Credits: 3, Prerequisite: ENG 208

ENG 420: American Literature (1620-1891)

The course covers the earliest writings in American literature starting from the colonial period to the 19th century. Writers include Ann Bradstreet, Jonathan Edwards, Nathaniel Hawthorne, Henry Wadsworth Longfellow, Henry David Thoreau, Henry James, Mark Twain and Whitman.
Prescribed Texts
Melville: *Billy Budd*
M. Twain: *Huckleberry Finn*
N. Hotharne: *The Scarlet Letter*
H .W. Thoreau: *Walden*
Whitman: *Song of Myself*
"When Lilacs Last in the Dooryard Bloomed"
Henry James: *Portrait of a Lady.*
Credits 3, Prerequisite: ENG 191 + at least 4 other literature courses

ENG 422: Bilingualism and EFL/ESL

This course introduces students to theoretical developments in Bilingualism, and their implication for teaching and learning English in Bangladesh.
Credits 3, Prerequisite: ENG 208

ENG 423: Old and Middle English

This course contains epics and poetical pieces written in Old and Middle English available in modern English translation.
Prescribed Texts, *Beowulf*
Piers Plowman, Adrian and Bardus, Ceix and Alcelone
Chaucer: *Prologue to the Canterbury Tales*
Credits 3, Prerequisite: ENG 191 + 4 other literature courses

ENG 424: Classics in Translation

The aim of this course is to familiarize students with the ancient classics in the form of Greek and Roman plays and epics in translation.
Prescribed Texts
Homer: *The Iliad*
Virgil: *Aeneid*
Aeschylus: *Agamemnon*
Sophocles: *Oedipus Rex*
Euripides: *Alcestis*
Aristophanes: *Frogs*
Credits 3, Prerequisite: ENG-191+4 other literature courses

ENG 426: American Literature (Modern to Contemporary)

The course will introduce students to the themes, ideas, and values prevalent in American literature of post World War II to the contemporary times. Writers will include Robert Frost, Eugene O'Neill, Earnest Hemingway, and Emily Dickinson.
Prescribed Texts
Robert Frost: Selected poems from the *Norton Anthology*
Dickinson: *Selected Poems from the Norton Anthology*
Eugene O'Neil: *Long Day's Journey into Night, Morning becomes Electra*
Hemingway: *The Sun also Rises*
Credits 3, Prerequisite: ENG 420+ at least 8 other literature courses.

ENG 430: Cultural Studies

The course will deal with writings on culture from the nineteenth century to modern culture studies. Writers include Mathew Arnold, Roland Barthes, Stuart Hall, Cornel West and Edward Said.
Credits 3, Prerequisite: Completion of at least 8 literature courses

ENG 435: Postcolonial Theory and Literature

Students will interrogate the category of postcolonial theory and literature to discern the pitfalls of using such a broad terminology. They will also enquire into the different forms of literature and writing that can be encompassed within this category. Texts to be studied will include selections from Edward Said, Homi Bhabha, Sara Suleri, Gayatri Spivak, Chandra Mohanty Talpade, Salman Rushdie, Chinua Achebe, R.K. Narayan, Meena Alexander and Bharati Mukherjee.
Credits 3, Prerequisite: Completion of at least 12 literature courses.

ENG 436: ELT Project

The purpose of this course is to provide students some practical training in doing ELT research. Students are required to do a mini-research project in any one of the following areas under a teacher's guidance:
Needs analysis
Designing a communicative syllabus.
Evaluating a syllabus
Evaluating materials and designing materials.
Evaluating teaching.
Evaluating tests and designing reading, writing, speaking and listening tests.
Learner's learning style preferences.
Learner's beliefs and expectations.
Credits 3, Prerequisite: 10 courses in Linguistics and ELT/Applied Linguistics

ENG 438: Literary Criticism

This course introduces students to some of the fundamental ideas of literary criticism. It examines different views about literature.

Prescribed Texts
Aristotle: *Poetics*
Johnson: "Preface to Shakespeare"
Dryden: " An Essay on Dramatic Poesie"
Wordsworth: "Preface to Lyrical Ballads"
Arnold: "The Study of Poetry"
Credits 3, Prerequisite: Completion of at least 12 literature courses

ENG 440: Literary Theory
The aim of this course is to familiarize students with different literary theories. The course includes selected works of Freud, Cleanth Brooks, E M Froster, M H Abrams, R Barthes, William Wordsworth, Fish, Said, and Kora Kaplan.
Credits 4, Prerequisite: ENG 438 + 12 other literature courses

ENG 445: Modern Poetry
Students will deal with the complexities of modernism and related issues. Poets include T S Eliot, W.B. Yeats, Ted Hughes, H.D, Marianne Moore, Dylan Thomas and W.H. Auden.
Prescribed Texts
W. B. Yeats:"Sailing to Byzantium"
 "Wild Swan at the Coole"
"The Second Coming"
"An Irish Seaman Foresees his death", "Easter 1916"
T.S.Eliot: "Love Song of J.Alfred Prufrock"
 "Portrait of a Lady", " *The Waste Land*"
W. H. Auden: Selections from the *Norton Anthology*
Ted Hughes: Selections from the *Norton Anthology*
H.D.: Selections from *Norton Anthology of Poetry* (4th edition)
Marianne Moore: Selections from *Norton Anthology* of Poetry (4th edition)
Dylan Thomas: Selected Poems
Credits 3, Prerequisite: ENG 320+ at least 7 other literature courses.

ENG 450: Modern Drama
In this course students will be familiarized with modern drama. Writers include G. B. Shaw, J. M. Synge, Samuel Beckett, George Osborne and Harold Pinter.
Prescribed Texts
G.B. Shaw: *Man and Superman*
J.M.Synge: *Playboy of the Western World*
Samuel Becket: *Waiting for Godot*
George Osborne: *Look Back in Anger*
Harold Pinter: *Birthday Party*
Credits: 3, Prerequisite: ENG 301 & ENG 310

ENG 451: Computer Assisted Language Learning (CALL)
The course will introduce students to the principles underlying the use of computer technology in language teaching and learning, relate these principles to practice, discuss CALL software through the exploration of relevant theories, principles and modes. By the end of the course students will be able to use the CALL software themselves to produce simple CALL programmes.
Credits: 3, Prerequisite: ENG 155+309

ENG 452: Contemporary English Literature
The course will include novels, poems and plays by some prominent writers of the 1950s, 60s and 70s from England. The following authors will be read:
John Fowles, A.S. Byatt, Harold Pinter, Tom Stoppard, Philip Larkin, Ted Hughes, A.S. Byalf and J. G. Farell
Credits: 3, Prerequisite: 5 Literature courses

ENG 455: Comparative Literature
This course includes non-English writers like R K Narayan, V S Naipaul, Arundhuti Roy, Chinua Achebe, Wole Soyinka, Naquib Mahfuz, and Nadine Gordimer.
Credits: 3, Prerequisite: Completion of at least 6 literature courses

ENG 458: Feminist Readings of Literature
This course examines representations of women in canonical literary works by men and women in the light of major issues raised by current feminist criticism. By the end of the semester students will be able to interpret texts using feminist terminology and judge them from a variety of feminist theoretical frameworks.
Credits: 3, Pre-requisite: 6 literature courses

FIN 101: Principles of Finance
Study of issuance, distribution and purchase of financial claims including the topics of financial management, financial investments and financial markets.
Credits: 3 Prerequisite: ACT 101,STA 101,ECO 101

FIN 201: Business Finance
The principle problems of managing the financial operations of an enterprise. Emphasis upon analysis and solution of problems pertaining policy decisions.
Credits: 3 Prerequisite: FIN 101

FIN 335: Financial Institutions and Markets
An understanding of money and capital markets and financial instruments traded in these market and the discussion of major financial institutions are the major focus of the course.
Credits: 3 Prerequisite: ECO 102, FIN 201

FIN 350: Real Estate Finance
Focuses on theory and practice in real estate, with social, legal and economic implication. Topics of this course are administration of real estate mortgage, source and uses of mortgage funds, permanent and secondary financing and an overview of lease financing.
Credits: 3 Prerequisite: FIN 201

FIN 380: Management of Commercial Bank
This course is designed to provide the students with tools and techniques to manage commercial banks. the

content of the course included: performance evaluation of a bank, asset-liability management, management of various kinds of risks, such as interest rate risks, and fund management and investment management.
Credits: 3 Prerequisite: FIN 201

FIN 408: Financial Analysis and Control
This course offers techniques for analyzing income statement and balance sheet of a firm. On the basis of the analysis, managers are to detect the deviation on difference of financial performance. It also focuses on the managerial applications of financial statement analysis of a firm and implements their results as a means of control.
Credits: 3 Prerequisite: ACT 201 FIN 201

FIN 410: Risk Management and Insurance
Examines the management of non-speculative risks in the business enterprise with emphasis on insurance as a tool. Topics included are concept of risk and insurance, risk analysis, treatment of risk control and financing, analysis of risk contracts in the areas of life, health, property and liability insurance.
Credits: 3 Prerequisite: FIN 201

FIN 425: Investment Analysis and Management
Survey of the problems and procedure of investment analysis and management. Types of investment risks, analysis of investment problems regarding the corporation as well as individuals.
Credits: 3 Prerequisite: FIN 201, MAT 311, STA 327

FIN 435: Managerial Finance
Examines in details the investment, financing and dividend policies of a corporation and their inter-relatedness. Topics included discussion of a debt policy, debt about dividend puzzle, interaction between investment and financing decisions and market for corporate control.
Credits: 3 Prerequisite: FIN 201

FIN 450: Cases in Financial Management
This course would provide the opportunity to learn the real tool through analyzing the real cases in the real world set up. This will increase the horizon of students thinking process about financial matters in depth. Case studies affecting the financial policies and position of the business unit, analysis of the financial problems, determination of alternatives and managerial decision making.
Credits: 3 Prerequisite: FIN 201

FIN/ITB 465: International Financial Management
Analyzing the form and tools of international financial transactions at an advanced level. Topics included are managing exchange rate, capital raising and investment decisions through international financial markets and other related issues.
Credits: 3 Prerequisite: FIN 201

FIN 475: Option and Future
Study of modern concepts and issues in financial options and futures markets. Emphasis on risk management in financial institutions and applications in corporate finance and fund management.
Credits: 3 Prerequisite: FIN 425

GEN 201: Bangladesh Studies
This course attempts to introduce the students to the basic socio-economic, cultural, historical, political , administrative and historical features of Bangladesh. The course also aims to encourage the critical thinking of the students to write short papers on issues associated with development and governance in Bangladesh.
Credits: 3 Prerequisite: ENG 102

GEN 202: Eastern Culture & Heritage
The objective of this course is to introduce students to the culture and civilization of eastern part of the world. The specific objective is to make the students with the major races, religious philosophy, cultural heritage and scholars of this region.
Credits: 3 Prerequisite: None

GEN 203: Ecological System & Environment
Topics include: Environment science, input reduction, population bomb, resources, ecology and population, abundance control, community diversity, energy flow, type of species, demography, resource management, biodiversity, pollution, controlling pollution, water pollution, air pollution, ethics.
Credits: 3 Prerequisite: None

GEN 204: Western Thought
The aim of this course is to introduce students with some masterpieces of Western literature. The course includes selections from William Shakespeare, Charles Dickens, Anthon Chekov, Guy de Mupassant, Robert Frost and T.S.Eliot.
Credits: 3 Prerequisite: None

GEN 205: Introduction to Psychology
The objective of this course is to provide knowledge about the basic concepts and principles of psychology pertaining to real-life problems. The course will familiarize students with the fundamental processes that occur within organism-biological basis of behavior, perception, motivation, emotion, learning, memory and forgetting and also to the social perspective-social perception and social forces that act upon the individual.
Credits: 3 Prerequisite: None

GEN 206: Introduction to Sociology
The objective of this course is to introduce students to key societal concepts, primary social institutions, social structure and stratification, religion and so on. They will also be familiar with the methods and different techniques of social research.
Credits: 3 Prerequisite: None

GEN 207: Industrial Psychology

The objective of this courses is to provide knowledge about human behavior in those aspects of life that are related to the production, distribution and use of the goods and services of our civilization. This course will also help to the application of pertinent information about human behavior to the solution of human problems in the industrial context.
Credits: 3 Prerequisite: none

GEN 208: Introduction to Philosophy

Topics include: Definition of philosophy, function of philosophy, relation of philosophy to religion & science, methods of philosophy, theories of the origin of knowledge, criterion of truth, nature of mind, theories of mind body relationship, the problem of value, nature, scope and utility of ethics.
Credits: 3 Prerequisite: None

GEN 209: Social Psychology

Topics include: Introduction, socialization, social perception, attitude, communication, interpersonal attraction . social influence, mass communication and collective behavior. Credits: 3 Prerequisite: None

GEN 210: International Relations

Topics include: Fundamental theories of international politcs, Elements of national power and prestige, Treaty of Versailles4 and the turmoil in Europe. Beginning of the Cold War (1945-1952). Kennedy and the (Flexible Response)(1960-1963). Root cause of Arab-Israeli conflict. Nixon - Kissinger and the Triangular Diplomacy (1970-1974) . Carter and the (Human Rights) foreign policy. American Foreign Policy (1980-1990). Bangladesh in post Cold War World order(1992-present).Major Civilization of the World (Universal or local). War and peace in post - Cold War World. Theoretical concepts of Diplomacy.
Credits: 3 Prerequisite: ENG 102

GEN 211: Concepts of Journalism & Media Studies

Journalism: This course is an examination of the basic tenets of the newspaper ,journalism and media studies-how to research, organized and write a story. This course also covers internal structure of a newspaper: advertising, circulation and editorial policies and practices. Newspaper censorship and libel laws will also be discussed.

Media Studies: Here the students will be introduced to the various forms of media including the print and electronic media such as newspaper, radio and TV. They will have to learn the operating systems of different forms of media with special reference to the applications of information technology in electronic medium like TV.
Credits: 3; Prerequisite: ENG 102.

GEN 212: Women in Development

This course will examine the role of women in economic development. It will also discuss the interrrelationship of various development and feminist theories; methodological approaches to the study of women in development. The course will also provide students with a conceptual overview and practical tools for understanding the role of women in the development process. It will provide an analysis of the gender dimensions of programs and policies that affect women in different international, regional and community context. The course will also include the historical role of women in the United Nations and other international organizations; feminist analysis of international relations and development theory; and the global women's movement.
Credits: 3; Prerequisite: ENG 101

HRM 301: Human Resources Management

This course covers factors in organizational performances, motivation and performance, HR planning; job design and staffing development and appraisal, compensation and reward, employee projection and representation and the future of HRM.
Credits: 3 Prerequisite: MGT 251

HRM 411: Human Resource Planning

This course introduces the importance of Human Resource planning in overall human resource management of an organization. Topics include issues in human resource planning; Models and methods of human resource planning; Forecasting future manpower requirements and availability; Assessing human resource goals and gaps; Action plan for bridging the gaps; System approach to annual manpower planning exercise, Econometric models and the use of different trend analysis for human resource forecasting and projections.
Credit:3 Prerequisite: MGT 251, HRM 301.

HRM 412: Compensation Management

This course focuses on strategies, procedures and problems in evaluating and rewarding employees. Topics include Performance measurement methods and integration of performance into compensation system; Process of developing a pay level and pay structure for the entire organization; Challenges of designing an effective pay system; Issues in administering an effective pay system; Effect of laws and regulations of pay; Performance measurement and evaluation; Managerial and executive compensation; Practices from comparative perspectives; Current pay issues and controversies.
Credit:3 Prerequisite: HRM 301

HRM 414: Industrial Relations

This course deals with maintaining healthy leabor relations and building a satisfied labor force for smooth operation of business. Topics include changing labor relations in the national and global context; Evolution of trade union movement and issues; Structure and activities of trade unions; Bargaining power, structure and related issues; Industrial disputes and conflict resolution; Strategies for dealing with unions, Grievance handling procedures; Special issues of woman and child labour, Industrial relations in non-union organizations;

Industrial relations and employee productivity; Maintaining organizational stability and disciplining employees behaviour; Employee relations programs; Compliance of labour laws; Legal environment and Trade Union movement in Bangladesh.
Credit 3 Prerequisite: HRM 301

HRM 415: Training and Development
This course focuses on developing employee knowledge, skills and attitude, developing competencies for improving productivity and achieving organizational goals. The topics include Human learning and behavior; Training and development function; Training need assessment; Various training methods and strategy for employee development; Designing and implementing training programs; Organization of the training department function; Evaluation of training programs and follow-up; Technical training; Employee development programs; Training and development of employees in long-term perspective.
Credit 3 Prerequisite: HRM 301

HRM 416: Strategic Human Resource Management
This course addresses the strategic role that human resource management plays in creating competitive advantages for firms. Major topics include Strategy formulation and implementation; Role of HRM in supporting the corporate strategies; Impact of workforce diversity and globalization; Finding the HR fit in the organizational goal setting and mission achievement; HR inputs in the organizational strategic management process; Human Resource Management in the face of rapid technological changes, globalization and rising employee expectations. Credit 3 Prerequisite: HRM 301

HRM 417: Human Resource Information System
This course focuses on the use of modern computer based information technology in the management of an organization's human resources. The course emphasizes the dependence on information technology in all sphere of management including human resources. This course aims at modernizing and increasing the efficiency of human resources managers through proper use of computer based information system and help them making judicious decisions on human resource planning and utilization.
Credit 3 Prerequisite: MIS 305, HRM 301

HRM 418: Job Analysis and Performance Appraisal
This course deals with analyzing job for selecting right people for the organization and evaluating employee performance for rewarding. Course topics include Job analysis and Job evaluation; Job analysis and selection; competency modeling; Measuring employee behaviour and performance; Various appraisal methods and systems; Developing and administering an effective performance appraisal system; Linking performance with reward; Motivating employees through rewards; Legal issues in performance appraisal administration; Emerging issues and innovations.
Credit 3 Prerequisite: HRM 301

HRM 419: Leadership, Power and Influence
This course focuses on identifying and understanding the leadership aspects and political manifestations of managerial power and influence. Course topics include Leadership behaviour and practices; Management and Leadership; Leadership models and styles; Sources and types of power and influence within organization; Power and influence dynamics; Strategies for gaining Power; Organization as a political entity; Advantages and disadvantages of organizational politics; Political behavior in relation to organizational structure and intensity and manifestations of political behavior.
Credit 3 Prerequisite: HRM 301

HRM 420: Organization Development
This course focuses on the issues of organizational development. Analysis of individual, position, department section and the overall organization to determine the need for development and taking appropriate measures are the core issues of this course. Major emphasis will be given on the human resource development and designing an organization complementary to the human behaviour and nature.
Credit: 3 Prerequisite: MIS 305, HRM 301

ICE 105: Computer Fundamentals & Programming Language
Computer Fundamentals: Evolution of computers, number systems and different computer codes, Boolean algebra and logic circuits, computer memory, input-output devices, CPU, operating systems and applications, computer networks, introduction to Internet, E-mail, E-Commerce, WWW, WAP, HTML, etc. Programming Language: Concept of programming language and its classification; Structured Programming using C: Constants, variables and data types, arithmetic and logical operation, loops and decision making, user-defined functions, character and strings, arrays, pointers, structures and unions, file management, graphics programming.
The course includes lab work based on theory taught.
Credits: 3+1=4; Prerequisite: None

ICE 107: Object Oriented Programming with C++
Object Oriented Concepts: Classes, objects, methods, inheritance, and class methods.
OO Design Techniques: Booch class diagrams, object interaction diagrams, event-based software.
OO Programming in C++: Classes and objects,, dynamic storage, input/output classed, operator overloading, inheritance, class and member functions and data, scope rules for members.
OO Programming in JAVA: Java foundation, control flow, abstract classes and packages, exception handling, applets, web based Java application, multithreading.
The course includes lab work based on theory taught.
Credits: 3+1=4; Prerequisite: ICE 105

ICE 206: Discrete Mathematics & Numerical Methods

Discrete Mathematics: Mathematical logic: propositional calculus, predicate calculus. Permutations, Combinations and Discrete Probability. Set theory: sets, relations, partial ordered sets, functions. Graph theory: graphs, paths, trees. Recurrence Relations and Recursive Algorithms. Algebraic structures: binary operations, semi groups, groups, permutation groups, rings and fields, lattices.

Numerical Methods: Solutions of polynomials and transcendental equations, Interpolation and polynomial approximation, Least square approximation, Solutions of systems of linear equations, Gauss elimination technique, Gauss-Siedel iteration technique, Numerical differentiation and integration, Numerical solutions of ordinary and partial differential equations.

The course includes lab work based on theory taught.
Credits: 3; Prerequisite: ICE 107

ICE 208: Data Structures & Algorithms

Abstract data types and data structures, Classes and objects, Complexity of Algorithms: worst case, average case, and amortized complexity. Algorithm analysis. Algorithm design paradigms. Lists: stacks, queues, implementation, garbage collection. Dictionaries: Hash tables, binary search trees, AVL trees, red-black trees, splay trees, skip-lists, B-trees. Priority queues. Graphs: Shortest path algorithms, minimal spanning tree algorithms, depth-first and breadth-first search. Sorting: Advanced sorting methods and their analysis, lower bound on complexity, order statistics.

The course includes lab work based on theory taught.
Credits: 3+1=4; Prerequisite: ICE 107

ICE 211: Electrical Circuits & Networks

Circuit Concepts: Active Circuit Elements: Voltage Sources, Current Sources; Passive Circuit Elements: Resistors, Inductors, and Capacitors with their properties; Sign Conventions; Ohm's Law.

Network Theorems and Circuit Analysis: Introduction; Kirchhoff's laws: Kirchhoff's Voltage Law (KVL), Kirchhoff's Current Law (KCL); Determination of Sign; Analysis Methods: Branch Current Method, Mesh Current Method; Delta-Star and Star-Delta Transformation; Maxwell's Loop Current Method; Superposition Theorem; Thevenin's Theorem; Norton's Theorem; Maximum Power Transfer Theorem.

A.C. Fundamentals: Equations of Alternating Voltages and Currents; Cycle, Time Period, Frequency and Amplitude of a Wave; Phase Difference; RMS and Average Values; A.C. through Resistance only; A.C. through Inductance only; A.C. through Capacitance only. Series and Parallel A.C. Circuits: A.C. through Resistance and Inductance; A.C. through Resistance and Capacitance; Series R-L-C Circuit; Resonance in R-L-C Circuits; Bandwidth of Resonance Circuit; Parallel A.C. Circuits; Simplification of Parallel R-L-C Circuits.

Poly Phase Circuits: Two-Phase system; Three-Phase System; Star Connection System; Delta Connection System; Balanced Star-Delta and Delta-Star Conversations.

Transients: Types of Transients; Transients in R-L Circuits (D.C and A.C); Transients in R-C Series Circuits (D.C. and A.C). The course includes lab work based on theory taught. Credits: 3+1=4; Prerequisite: PHY 102

ICE 212: Basic Electronics & Devices

Introduction to Semiconductor Physics: Energy band gap; Intrinsic and extrinsic semiconductors; Mobility; Drift velocity; N and P type semiconductors; PN junction diodes and their V-I characteristics; Zener diode; Varactor diode; Thermistor and photodiode.

Diode Circuits: Ideal rectifier concept; Half wave and full wave rectifiers; Filters; Voltage regulators; Voltage doubler; Clippers; Clampers.

Bipolar Transistor: CE, CB and CC configurations; Biasing; Operating point; Load lines (AC and DC); Current gain, voltage gain, power gain; Input impedance; Output impedance; Analysis of small signal low-frequency transistor amplifier by using h-parameters.

FET: Types of FET; Construction; Characteristic curve; Principle of operation; Channel conductivity; Channel Ohmic and pinch-off region; Characteristics parameter of the FET; Effect of temperature on FET; Common source AC amplifier; Common drain amplifier; Depletion type and Enhancement type MOSFET.

Filters: Properties of symmetrical networks; Characteristics impedance; Filter fundamentals; Different types of filters; Constant – K and m – derived filters; Design conditions; Uses, Active Filters.

Optoelectronic Devices: PN photodiode; Phototransistor; Solar cell; Photoconductive cell; Photovoltaic sensors; LED; LCD; Alghumeic display; Photocouplers; High speed optical detectors.

Semiconductor Devices: Working principle and application of tunnel diode, Thyristor, SCR, UJT, Diac and Triac; Semiconductor sensors and detectors; Microwave transistors; PIN diode switches; IMPATT and BARITT diodes.

Microelectronics: Microelectronics technology; Planer processor; Bipolar transistor fabrication; FET fabrication; CMOS technology; Monolithic diodes; Metal semiconductor contact; IC resistor and capacitor; IC packaging; Characteristics of IC components; Microelectronic circuit layout; Printed circuit board.

The course includes lab work based on theory taught.
Credits: 3+1=4; Prerequisite: ICE 211

ICE 214: Electronic Circuits

Power Amplifiers: Classification of power amplifiers; Collector efficiency; Transformer coupled class A amplifier; Class B Push-Pull amplifier; Class C amplifier; Tuned amplifier.

Low-frequency Amplifiers: Effect of emitter bypass capacitor; Effect of coupling capacitors; Cascading of CE stage; Mid-frequency gain; Low-frequency response of cascaded stages; Transformer coupled amplifier.

High-frequency Amplifiers: High-frequency model for CE

amplifier; CE short circuit current gain; High-frequency current gain with resistive load; High-frequency response of cascaded CE stages; Transformer coupled amplifier; Transistor noises.

Feedback and Oscillators: Concept of feedback; Negative feedback; Positive feedback; Voltage feedback; Current feedback; Effect of feedback on impedance gain, gain, bandwidth and distortion; Stabilization; Positive feedback; Condition of oscillation; RC Phase shift oscillators; Wein bridge oscillators; Resonant circuit oscillators; Crystal oscillators; Waveform generators.

Operational Amplifiers: Difference amplifier; CMMR; Ideal operational amplifier; Inverting amplifier; Non-inverting amplifier; General-purpose IC operational amplifier; Integrator; Differentiator.

The course includes lab work based on theory taught.
Credits: 3+1=4; Prerequisite: ICE 212

ICE 301: Database Management Systems

Design of database kernels; Query optimization, (rewriting techniques, access methods, join algorithms, plan evaluation), transaction management (ARIES); Distributed databases (query processing and optimization, concurrency control, commit protocols); Object-relational databases (motivation, design & implementation); Spatial databases (storage, indexing techniques, query optimization); Data mining (association, classification and sequence rules, integration with database engines); Data warehousing (star and snowflake schemes, data cubes, view maintenance); Semi-structured and Web databases (data models, query systems, XML, XML-schema, relational storage, compression); Mobile databases (broadcast disks, indexing techniques); Applications to E-commerce.

The course includes lab work based on theory taught.
Credits: 3+1=4; Prerequisite: ICE 208

ICE 302: Computer Communications & Networking

Introduction to computer and telecommunication networks, types of switching- circuit message and packet, transmission media characteristics, data communication principles – asynchronous and synchronous, layered architecture for computer networks, 7 layer OSI network model, standards for different layers, RS-232 C, X. 21. HDLC, X. 25 TCP/IP etc. network topologies, WAN, MAN, Intranet and LAN technology, IEEE 802 standards, ISDN & B-ISDN, frame relay and ATM network, traffic theory and network performance.

The course includes lab work based on theory taught.
Credits: 3+1=4; Prerequisite: ICE 105

ICE 303: Signals & Systems

Introduction to Signals and Systems: Definitions of signals and systems; overview of specific systems; classification of signals; basic operations on signals; elementary signals; systems viewed as interconnection of operations; properties of systems.

Linear Time-Invariant Systems: Introduction; Convolution: Impulse Response Representation for LTI Systems; Properties of the Impulse Response Representation for LTI Systems; Differential and Difference Equation Representations for LTI Systems; Block Diagram Representations; State Variable Descriptions for LTI Systems; Exploring Concepts with MATLAB.

Fourier Representations for Signals: Introduction; Discrete-Time Periodic Signals: The Discrete-Time Fourier Series; Continuous-Time Periodic Signals: The Fourier Series; Discrete-Time Nonperiodic Signals: The Discrete-Time Fourier Transform; Continuous-Time Nonperiodic Signals: The Fourier Transform; Properties of Fourier Representations; Applications of Fourier Representations; Exploring Concepts with MATLAB.

The Laplace Transform: Introduction; The Laplace Transform; The Unilateral Laplace Transform; Inversion of the Laplace Transform; Solving Differential Equations with Initial Conditions; The Bilateral Laplace Transform; Transform Analysis of Systems; Applications of Laplace Transform; Exploring Concepts with MATLAB.

The z-Transform: Introduction; The z-Transform; Properties of the Region of Convergence; Properties of the z-Transform; Inversion of the z-Transform; Transform Analysis of LTI Systems; Computational Structures for Implementing Discrete-Time Systems; The Unilateral z-Transform; Exploring Concepts with MATLAB.

Introduction to Digital Filters: Infinite Impulse Response (IIR) Filter Design; Design of Finite-Duration Impulse Response (FIR) Digital Filters.

The course includes MATLAB-based lab work based on theory taught.
Credit: 3+1=4; Prerequisite: ICE 211

ICE 310: Electromagnetic Theory

Maxwell's equations, displacement current, equation of continuity, boundary condition. propagation of uniform plane waves in perfect dielectric and in lossy medium, reflection, refraction, phase and group velocities, transmission line: evaluation of line parameters, design concepts, cutoff frequency, attenuation, dispersion, power handling capacity, traveling waves, standing waves, Smith chart and matching techniques, pulse propagation, radiation concept: elementary dipole, half-wave dipole, radiation patterns, gain, pattern multiplication, basic antennas.

Credits: 3; Prerequisite: PHY 102

ICE 311: Digital Electronic Circuits

Switching algebra, minimizing functions using maps, different logic families, TTL, ECL, NMOS, CMOS, pass transistor logic, combinational logic circuits:- adders/subtractor, demultiplexers, encoders, decoders, ROMs, PLAs etc. sequential logic circuits:- flip flops and latches, shifters, counters, finite state machine - state transition diagrams and state transition tables, memory elements:- ROM, PROM, RAM-SRAM, DRAM. case studies: a simple computer, RTL - micro-instruction,

instruction decoders timing and controller circuits, data path unit.

The course includes lab work based on theory taught.
Credits: 3+1=4; Prerequisite: ICE 214

ICE 312 Analog Communications

Introduction: Introduction to communication systems; Sources of information; Communication channels; Baseband and passband signals; Representation of signals and systems; The modulation process; Analog versus digital communications.

Random Processes: Concept of probability; Random variables; Statistical averages; Transformation of random variables; Random processes; Stationarity; Mean, Correlation, and Covariance functions; Ergodicity; Transformation of a random process through a linear filter; Power spectral density; Gaussian Process; Noise; Narrow-band noise; Sine wave plus narrow-band noise.

Continuous-Wave Modulation: Amplitude modulation; Double sideband-suppressed carrier modulation; Filtering of sidebands; Vestigial sideband modulation; Single sideband modulation; Frequency translation; Frequency-division multipleing; Angle modulation; Frequency modulation; Phase-locked loop; Nonlinear effects in FM systems; The superheterodyne receiver; Receiver model; Noise in DSB-SC receivers; Noise in SSB receivers; Noise in AM receivers; Noise in FM receivers; Pre-emphasis and de-emphasis in FM.

Pulse Modulation: Sampling process; Pulse-amplitude modulation; Time-division multiplexing; Pulse-position modulation; Bandwidth-noise trade-off; The quantization process; Pulse-code modulation; Noise consideration in PCM systems; Delta modulation; Differential pulse-code modulation; Coding speech at low bit rates.
Credits: 3; Prerequisite: ICE 303.

ICE 314 Digital Communications

Signal Space Analysis: Additive white Gaussian noise (AWGN) model of a channel; Geometric representation of signals; Schwartz inequality; Gram-Schmidt orthogonalization procedure; Conversion of the Continuous AWGN channel into a vector channel; likelihood functions; maximum likelihood decoding; Correlation receiver; Probability of error.

Baseband Signal Transmission: The matched filter, properties of the matched filter; Error rate due to noise; Intersymbol interference; Nyquist's criterion for distorsionless baseband binary transmission; Correlative level coding; Baseband M-ary PAM transmission; Digital subscriber lines; Optimum linear receiver; Adaptive equalization.

Passband Signal Transmission: Passband transmission model; Hierarchy of digital modulation techniques; Coherent binary phase-shift keying (PSK); Coherent binary frequency-shift keying (FSK); Coherent quadriphase-shift keying (QPSK); Coherent minimum phase-shift keying (MSK); Noncoherent orthogonal modulation; Noncoherent binary FSK; Differential PSK (DPSK); M-ary PSK; M-ary quadrature Amplitude

modulation (QAM); M-ary FSK; Power spectra; Bandwidth efficiency; Synchronization; Discrete Multitone (DMT); DFT-based DMT system, applications of DMT; Introduction to OFDM; Spreads-spectrum concept.

Information Theory: Uncertainty, information, and entropy; Source-coding theorem; Discrete memoryless channels; Mutual information; Channel capacity; Channel-coding theorem; Differential entropy and mutual information for continuous ensembles; Information capacity theorem and its implications; Rate distortion theory.

The Course includes lab work based on theory taught.
Credit: 3+1=4; Prerequisite: ICE 312

ICE 320: RF & Microwave Engineering

S-matrix representation, resonators, filters, waveguides and planar structures, design concepts, attenuation, dispersion, power handling capability; passive components: non-reciprocal components etc. microwave sources: magnetron, TWT, BWO, IMPATT & GUNN, microwave systems and antennas, micro strip lines, magic tee.

This course includes lab work based on theory taught.
Credits: 3+1=4; Prerequisite: ICE 310

ICE 325: Computer Organization and Operating Systems

Computer Organization: Computer arithmetic, point representations, introduction to CISC processor architecture, instruction set and addressing modes, hardware design principles polling of processors, memory types & interfacing & timing I/O handling, interrupts & DMA & device interfaces – CRT, floppy disk, HDD, optical disk, serial interfaces & data acquisition, software interrupts, memory hierarchy and virtual memory, multiprocessors concept, cache memory, pipelining and introduction to RISC processors, super scalar processors.

Operating Systems: Operating system concepts & architectural support – privileged mode; operating system design and construction techniques; WINDOWS operating system, concepts of LINUX/UNIX operating systems; kernels; NOS.

The course includes lab works based on theory taught.
Credits: 3; Prerequisite: ICE 311

ICE 327: Network Programming with JAVA

Introduction to networking and internet protocols, Complete coverage of the Java networking and I/O APIs, Details of multithreading and exception handling, Byte, Character, Object and Message streams, IP, TCP, UDP, Multicast, HTTP, RMI, CORBA and Servlets, Ping, Fingers, Clients and Servers, Mail Server, Pop-up Server, SMTP Server, SAMBA Server, DNS Server; Multiprotocol chat systems and whiteboards.

This course includes lab work based on theory taught.
Credits: 3+1=4; Prerequisite: ICE 302

ICE 402: Web Page Development & Management

The course will address on how to develop World Wide Web (WWW) and navigate the web. An overview of Hypermedia, Information retrieval, SGML and HTML, elements of web pages, Manipulating text, Use of graphics etc. The structure and genealogy of the internet will be addressed and a brief idea about web page hosting and promotional tools of WWW, Legal and ethical considerations of web based applications, data security, writing applications for the client end, Communication with server scripts and databases for processing, Issues in platform independent client applications will also be given.
The course includes lab work based on theory taught.
Credits: 3; Prerequisite: ICE 107

ICE 403: System Analysis & Design

Application Development Policy and Strategies: Planning of Information System, Policy in Information System Development, Strategies for achieving Information System goals.
Application System Development Life Cycle: Phases in Application System Development, interrelationship among each phase.
Feasibility assessment: problems and needs in Information System Development, preliminary application requirement determination, economic, technical operational and schedule feasibility. Information Requirements Determination: Strategies for obtaining information requirements, techniques for information requirements determination, methods for providing assurance that requirement are correct and complete.
Structured System Analysis: Steps in Structured System Analysis, Activity Diagrams and related documentation, data dictionary, problem analysis, structured walk through. System Design Methodology: CheckList Methodology, Process-Oriented Methodology, Application Generator, Structured Design. Program Development and Testing: Structured Programming, Method for Testing.
Credits: 3; Prerequisite: ICE 107

ICE 404: Software Engineering

Software: Its nature and qualities. Software Engineering Principles: Rigor and formality, separation of concerns, modularity, abstraction, incrementally. The Software Process: Process models, planning, cost estimation and project control, software design. Modularization Structure, representation, interface and information hiding design notations. Object-Oriented Design: Object paradigm, introduction to a specific object-oriented design technique. Software Specification: Operational specification–semi-formal schemes, asynchronous systems–Petri nets, Descriptive specification–traditional scheme, ER model and logic, introduction to a formal scheme (Z). Software verification, software testing, Software tools and environments.
The course includes lab work based on theory taught.
Credits: 3; Prerequisite: ICE 208

ICE 405: Communications Languages & Software

The course will cover Socket programming, NS2/OPNET, basic Linux/Unix, and other network languages and software to control and setup network connections.
The course includes lab work based on theory taught.
Credits: 3; Prerequisite: ICE 327

ICE 406: Telecommunications Hardware/Software Interfaces

This course should cover the telecommunications signals and their BER/SNR measurements, hardware and bus/wire/pin configurations of telecommunications equipments, e.g., configurations of modems, computers, modulators/demodulators, filters, amplifiers, telephone handsets, laptop computers, mobile handsets, antennas, satellite/mobile/wired connections with terminal equipment, and testing of these devices and the software that are used to control these hardware.
The course includes lab work based on theory taught.
Credits: 3; Prerequisite: ICE 327

ICE 410: Optoelectronics & Photonics

Nature of light, basic optical laws and definitions, fiber types, fiber attenuation and dispersions, numerical aperture, modes, elementary discussion of propagation in optical fibers, the manufacture and assessment of silica fibers and cables. LED's: structures, light sources materials, efficiency. Laser diodes: structures and threshold conditions, modulation capability, light source linearity, noise, pin photodetector, avalanche photodiodes, noise, response time. Features of optical integrated circuits, theory of optical waveguides, waveguide fabrication techniques, losses in optical waveguides, integrated optical devices, components of the optical fiber link, modulation, multiplexing and coupling, system performance, receiver, sensitivity, coherent optical communications. LCD, CCD, luminescent screens, radar tubes, kinescopes, storage tubes, camera tubes. The course includes lab work based on theory taught. Credits: 3; Prerequisite: ICE 214, ICE 310

ICE 411: Digital Signal Processing

Signal representation using unitary transforms, DFT, DCT, Haar and Walsh Hadmard transform, properties of DFT, circular convolution, linear convolution using DFT, overlap add and save methods, FFT, filter structures for IIR and FIR filters, direct form I and II, parallel and cascade forms, frequency sampling structure for FIR filters, linear phase FIR filters, digital filter design techniques, IIR filter design by impulse invariance and bilinear transformation, transformation of digital filters, FIR filter design using windows, MATLAB based examples, introduction to multirate DSP, decimation and interpolation, polyphase decomposition, uniform DFT filter banks, quadrature mirror filters and perfect reconstruction, introduction to finite register length effects on digital filter performance, spectral estimation. The course includes lab work based on theory taught.
Credit: 3; Prerequisite: ICE 314

ICE 412: Wireless & Mobile Communications

Evolution of mobile cellular communication, concept of cell and reuse pattern, RBS, MTSO, cell sectoring, cell splitting, roaming, handoff, forced termination, FCA and DCA technique, standards of GSM, GSM architecture, HLR, VLR, ILR, EIR, channel coding, interleaving, frequency hopping, cell planning and traffic analysis, concept of CDMA, convolutional coding, block interleaver, Walsh function, PN sequence generator, QPSK and OQPSK modulation, long code generator, pilot channel, synch channel, paging channel, access channel and traffic channel, ad-hoc mobile cellular communication, satellite based mobile cellular communication, IMT-2000, Mobile IP.
The course includes lab work based on theory taught.
Credits: 3+1=4; Prerequisite: ICE 314

ICE 414: Optical Communications

Characteristics of optical transmission media, optical fibers - preparation and transmission characteristics, loss and dispersion mechanisms, optical sources - principles of operation, modulation characteristics and driver circuits, photo detectors–principles of operation, circuits and performance, post detection amplifiers, fiber optic communication systems and link budget using direct detection, fiber optic connectors, couplers, multiplexers and splices, wavelength converters, routers, optical amplifiers, coherent and WDM systems.
Credits: 3; Prerequisite: ICE 314

ICE 415: Satellite Communications

Introduction to communication using satellites. Kepler's laws and orbital mechanics, satellite launching, propagation characteristics, frequency spectra and bands, satellites sub-systems, earth station technology, multiple access techniques, applications of GEO, MEO, LEO and V-SATS, mobile satellite communications.
Credits: 3; Prerequisite: ICE 412

ICE 416: Microprocessors & Interfacing

Microprocessor and its Architecture: Internal microprocessor architecture, real mode memory addressing, protected mode memory addressing, memory paging.
Addressing Modes: Data addressing modes, program memory addressing modes, stack memory-addressing modes.
Data Movement Instructions: MOV, PUSH/POP, load effective addresses, string data transfer, miscellaneous data transfer instructions, segment override prefix, assembler.
Arithmetic, Logic and Program Control Instructions: Arithmetic operations, BCD and ASCII arithmetic, basic logic instructions, shift and rotate, string comparisons, the jump group, controlling the flow of assembly language program, procedures, interrupts, machine control instructions.
Programming in Microprocessor: Modular programming, using keyboard and video display, data conversions, disk files.
8086/8088 Hardware Specifications: Pin outs and pin functions, clock generators, bus buffering and latching, bus timing, ready and the wait state, minimum mode and maximum mode.
Peripheral Interfacing: Parallel versus serial transmission, synchronous and asynchronous serial data transmission, interfacing of hexadecimal keyboard and display unit, CRT terminal interfacing, printer interface, floppy disk interface, DMA controllers.
80186, 80286, 80386, 80486, Pentium and Pentium Pro Microprocessors: Introduction, memory management, special features.
The course includes lab work based on theory taught.
Credits: 3+1=4; Prerequisite: ICE 311

ICE 417: Artificial Intelligence & Expert Systems

Artificial Intelligence: Artificial Intelligence Techniques: Logic: propositional logic, first order logic, resolution principle. Problem Representation: state-space representation, problem reduction representation. Production System: PS structure, recognition-action cycle, inference directions, blackboard systems, PS implementation. Frame Representation: basic structure, inheritance of properties, slot extension, implementation. Relational Data Model: relational database model, entity and relationship, generalization and aggregation. Search: blind and non-blind searches, depth-first search, breadth-first search, heuristic search, best-first search, optimal search, A search. Implementation Complexity. Major AI programming Languages: LISP and PROLOG.
Expert Systems: Basic Principles of Expert Systems. Natural Language Processing, Medical diagnostics, Financial design, and manufacturing planning.
Credits: 3; Prerequisite: ICE 208

ICE 419: Digital Image Processing

Digital image fundamentals: image digitization, sampling and quantization, image resolution, color perception & processing, image processing: pixel based transformation, geometric transformation, local processing (edge detection, subpixed location estimation) restoration (degradation, inverse fitting & Wiener filtering), binary image processing: thresholding, runlength encoding, distance transforms, medial axis transforms, morphological operations, region segmentation & representation: split & merge algorithm, region growing, image filtering – histogram modification, linear and Gaussian filters, contours – digital curves, polyline splitting, Hop-Along algorithm, Conic & Splines Hough transform, Fourier description, textures: statistical syntactic and model based methods, image transforms – Fourier, Hadamard, discrete cosine, wavelets and other orthogonal transforms, compression image (predictive compression methods, vector quantization, hierarchical and progressive methods, JPEG and MPEG), case studies.
The course includes lab work based on theory taught.
Credits: 3; Prerequisite: ICE 303

ICE 421: Error Control Coding

Introduction to error control coding, elements of linear algebra and set theory, block coding and decoding–algebraic , cyclic and RS codes, performance of block codes, convolution coding and decoding–types of codes and their properties, majority logic, sequential and Viterbi decoding, interleaving, multi- stage coding techniques, punctured and Turbo codes, TCM, system application examples.

The course includes lab work based on theory taught.
Credits: 3; Prerequisite: ICE 314

ICE 423: Telecommunications Networks & Switching

Telephone Switching: Simple telephone connection, introduction to switching and signaling systems, single and multi- stage space switching analysis and design. Time/Digital switching systems, TS, ST, STS, TST systems, concept of packet switching and ATM, practical systems, circuit switching hierarchy and routing, signaling systems – SS7., telephone instruments, pulse and tone dialing, BORSCHT functions, modems, digital subscribers loops, telephone traffic theory.

Telephone Networks: Motivation for ISDN, New services, network and protocol architecture, transmission channels, user-network interfaces, service characterization, internetworking, ISDN standards, expert systems in ISDN, B-ISDN, voice data integration.
Credits: 3; Prerequisite: ICE 314

ICE 424: VLSI Engineering

Introduction to the VLSI design flow, unit processes in VLSI (oxidation, diffusion, lithography, ion implantation, metallization, etc,), isolation schemes, bipolar and CMOS processing, analog ICs CMOS OPAMP static and dynamic CMOS/BICMOS and logic PLA circuits, SRAM, DRAM, introduction to mixed signal ICs, basic design methodologies: full custom and semi-custom design, ASIC field programmable devices, optimization at various levels, (algorithmic architecture, logic, circuit, device), simulation and testing, design rules, floor planning, placement, routing and layout, mask making procedure, parasities and other non-idealities, timing issues, clock skew etc, importance of device modeling.
The course includes lab work based on theory taught.
Credits: 3; Prerequisite: ICE 311

ICE 425: VLSI for Telecommunications

System integration in single chip/multichip module, system partitioning, high throughput and low latency design requirement for real-time communication, critical path analysis for high speed VLSI design, switched capacitor circuits, high speed A/D and D/A converters, concepts of mixed signal design, VLSI CAD tools, software and languages, low power circuits/architecture design methodologies, high speed switching circuits, high speed memory organization, high speed control & decision circuits, design of analog front ends, impedance matching with bonding pads, Si-Ge devices for RF circuits, interface for optical fibers, VLSI for generation

and detection of PSK, FSK, QAM etc, subscriber line interface circuits, network switching circuits, VLSI systems for modem design, adaptive filters, equalizers, CVSD codecs, PLL, ISDN, UDLT, USART, Viterbi decoding, data encryption, DSPs, audio/video compression, video conferencing, Case studies for implementation of specific protocols currently in vogue. The course includes lab work based on theory taught.
Credits: 3; Prerequisite: ICE 423

ICE 426: Neural Networks and Applications

Neurons and neural networks, basic models of artificial neural networks: simple layer perception, feed forward multilayer perceptron, Hopfield networks, competitive learning networks, applications of neural networks for matrix algebra problems, adaptive filtering and adaptive pattern recognition, dynamic system identification, dynamic system modeling using recurrent neural networks, approximation/optimization problems, VLSI implementation of neural networks.
Credits: 3; Prerequisite: ICE 424

ICE 427: Computer Graphics & Visualizations

Scientific Visualization: An Engineering Perspective; Overview of Computer Graphics for Visualization; Data Analysis for Visualization; Scalar Visualization Techniques; A Unified framework for flow Visualization; Continuous Volume Display; Animation and Examination of Behaviour Over Time; System Aspects of Visualization Application, Visualization Geometry and Algorithm, Surface Extraction, Solid Representation Techniques, CSG, B-Rep, Octree, Modeling Complexity, Application of Visualization to design and Analysis, Research Issues using Solid Modeling for Visualization.
The course includes lab work based on theory taught.
Credits: 3; Prerequisite: ICE 208

ICE 428: Robotic Technology

Robotic manipulation, direct kinematics – the arm equation; inverse kinematics – solving the arm equation, workspace analysis and trajectory planning, differential motion and static manipulator dynamics, robot control, task planning. Credits: 3; Prerequisite: MAT 102

ICE 430: Communications and Network Security

Basic concepts of cryptography, mathematical overview of number theory, complexity and information theory, simple crypto systems - transpositions, substitution ciphers, homophonic ciphers, polyalphabetic ciphers, rotor machines, crypto analysis principles, private key systems, public key systems, signature systems, hash functions, cryptographic techniques, key sharing mechanisms, access control security policy, systems like Kerberos, fire walls.
Credits: 3; Prerequisite: ICE 302, ICE 423

ICE 431: Broadband Networks

Introduction to broadband communication services and quality requirements, broadband reference model,

broadband traffic characterization, ATM – switching and multiplexing techniques, ATM protocol architecture, ATM adaptation layer, ATM signaling, ATM networks, ATM switching architectures, ATM congestion control techniques, FDDI, SDH, and SONET, optical networking – WDM networking and routing, photonic switching, optical access, edge and core networks, all optical networks, broadband access technologies – modems, XDSL, HFC, wireless, cable modems, emerging broadband communication and networking technologies. The course includes lab work based on theory taught. Credits: 3; Prerequisite: ICE 302, ICE 314

ICE 432: Multimedia Communications Technology
Introduction to multimedia signals, characteristics of speech, audio, data, picture and video signals, source modeling and traffic features, speech and video coding techniques and standards, multimedia terminals, multimedia communication techniques – channels, bandwidth and networks, multimedia protocols and standards. The course includes lab work based on theory taught. Credits: 3; Prerequisite: ICE 314

ICE 435: Antenna Engineering
Concepts of lines of force, closed electric and magnetic lines, Maxwell's equations, transmission lines, short antennas and radiations, examples of short antennas, basic antenna parameters, point sources and array of point sources, self and mutual impedances, reciprocity theorem, loop and helical antennas, folded dipole and Yagi-uda array; Babinet's principle: slot, horn and complimentary antennas, radiation from apertures, ridge and corrugated horns, GTD, reflector antennas, baluns, antenna for mobile communication, antenna measurements. The course includes lab work based on theory taught. Credits: 3; Prerequisite: ICE 320

ICE 498: Project Work
Each student will be assigned a project under the supervision of a faculty member. The student must complete the project within one consecutive semester. Credits: 3.

ICE 499: Industrial Training
Each student will be placed for industrial training of one semester duration in an organization of related industry. The student must complete the training within one consecutive semester. Credits: 3.

ITB 301: International Business
Analyses the major business management functions of international business environment, organizational policies, and strategies of multinational companies, industrial relations and control policies.
Credits: 3 Prerequisite: MGT 101, MKT 101, ECO 102

ITB 401: International Operations
Emphasis on the factors influencing marketing to and within foreign countries and the alternative methods of operations open to international firms.
Credits 3 Prerequisite: ITB 301

ITB 428: International Economics
This course provides students with an understanding of international payments, balance of payments and foreign exchange markets, alternative international monetary arrangements and adjustments. This course will examine trade theory and policy and trade problems in multinational companies or in specific countries.
Credits 3 Prerequisite: ITB 301

ITB 445: International Financial Institution
The course attempts to provide greater understanding of foreign exchange market and its intricacies with international trade. Major topics will include balance of payments, exchange rate regimes, Spot market, Forward market, BP curve, J-curve and the practices of IMF, World Bank, ADB, IDB, and other multilateral institutions.
Credits 3 Prerequisite: ITB 301, FIN 201

ITB 450: International Business Negotiations
This course deals with the development of the conflict resolution, negotiating in the International context, mediation in International conflict, adjudication: International arbitral tribunals and courts, social-psychological dimensions of International conflict, Interactive conflict resolution, and contributions of training to International conflict resolution.
Credits 3 Prerequisite: ITB 301

ITB 455: Country Risk Analysis
This course provides framework for identification and analysis of economic and political issues of a country to assess the risk factors of that particular country. Topics include demographic trends, social issues, cultural knowledge through case analysis that will help students to develop skills necessary to identify, assess and deal with issues of risks and uncertainty in various countries.
Credits 3 Prerequisite: ITB 301

ITB 460: International Competitiveness
How a country competes in the world is the crucial factor in determining that countrys ability to benefit from international trade in to-days global economy. This course offers a complete and proper understanding of the meaning of International competitiveness, analyzes the implications it holds for an economys progress, examines how it may be pursued and sustained at both the sectoral level (firms and industries) and the national level (strategic objectives). It would offer pertinent policy guidelines and prescriptions for how a nation can achieve and maintain international competitiveness in order to sustain the long-term prosperity of its industries, and hence the overall pace of economic growth.
Credits 3 Prerequisite: ITB 301

ITB/FIN 465: International Financial Management
Analyzing the form and tools of international financial

transactions at an advanced level. Topics included are managing exchange rate, capital raising and investment decisions through international financial markets and other related issues. Credits 3 Prerequisite: FIN 201

ITB/MKT 408: International Marketing
Analysis of international operations. Emphasis on the factors influencing marketing to and within foreign countries and the alternative methods of operations open to international firms.
Credits: 3 Prerequisite: ITB 301, MKT 201

MAT 099: Remedial Mathematics
Unit System: Definition of Unit and types of Unit System. Numbers: Concepts on digits, real numbers, natural numbers, whole numbers, even numbers, odd numbers, composite number, imaginary number, pure imaginary numbers & complex numbers. Concept on factor & multiple.

Set: Concepts on different types of sets such as empty set, universal set, equal set, subset, proper and improper subsets. The union and intersection of sets. Formation of Venn diagram of different types of sets.

Linear Equations & Inequalities: Basic concepts on linear equations and inequalities. Methods of Solution of linear equations and inequlities in one variable. Graph plotting of linear inequalities.

Polynomials: Concept on polynomials, monomials, binomials and trinomials. Degree of a polynomial. Basic concepts of function. Simplification and division of polynomials.

Factorization: Factorization rules and middle term factor method. Absolute Value Equations & Inequalities: Solution of Absolute Value equations. Solving and plotting absolute value inequalities. Exponents & Redicals: Theorems of exponents and radicals and their problems.

Radical Equations: Solution of Radical Equations.

Approximations: Concept on significant figures and decimal places.

Areas & Volumes: Detarmination of the areas of triangle (Pythagoras theorem, concept of perimeter), Square, rectangle, parallelogram and Trapezium. Determination of the volumes of box, cube and sphere.

Ratio & Proportion: Basic concept on ratio and proportion. Solving problems using ratios, proportions, and proportional divisions.

Percentage & Percentage Gain & Loss: Problems of finding percentage and percentage gain and loss.

Coordinate System & Graph Plotting: Concept on two-dimensional coordinate system

(Cartesian System). Graphs of straight line and parabola.

Simultaneous Equations: Solution of the simultaneous equations (Algebraic and graphical solutions)

Progression: Arithmetic and Geometric Progression.
Credits: 0; Prerequisite: None

MAT 100: College Mathematics
Differential Calculus: Function, Basic concepts on Limits and Continuity ,Technique of Differentiation, Indeterminate forms, Maxima and Minima of Functions. Points of Inflection, Function of Two or More Variables, Partial Derivatives, Euler's Theorem on Homogeneous Function. Integral Calculas: Integration- the inverse of the differentiation. System of Linear Equations and Matrices. Permutation and Combination, Binomial Theorem.
Credits 3; Prerequisite: None.

MAT 101: Differential & Integral Calculus
Differential Calculus: Limit, Continuity and differentiability. Successive differentiation of various types of functions. Leibnitz's theorem. Rolle's theorem. Mean value theorems. Taylor's and Maclaurin's theorems in finite and infinite forms. Lagrange's form of remainders. Cauchy's form of remainders. Expansion of functions. Evaluation of indeterminate forms by L'Hospital rule. Partial differentiation. Euler's theorem. Tangent and normal. Concavity of functions. Determination of maximum and minimum values of functions and points of inflection with Applications. Curvature, Asymptotes.

Integral Calculus: Integration by the method of substitution. Standard integrals. Integration by successive reduction. Definite integrals, its properties and use in summing series. Walli's formulae. Improper integrals. Beta function and Gamma function. Area under a plane curve and area of a region enclosed by two curves in cartesian and polar co-ordinates. Volumes of solids of revolution. Volume of hollow solids of revolution by shell method. Area of surface of revolution. Jacobians. Multiple integrals with applications.
Credits 3; Pre-requisites: None.

MAT 102: Differential Equations & Special Functions
Ordinary Differential Equations: Degree and order of ordinary differential equations. Formation of differential equations. Solutions of first order differential equations; Separable & homogeneous equations, Exact equation. Integrating factor. Equations made exact by integrating factors. First order linear equation. Bernoulli's equation. Higher order linear homogeneous equation with constant coefficients. Initial and Boundary value problems. Linear non-homogeneous equation with constant coefficients: Method of undetermined coefficients, Method of variation of parameters, Operator method; Series solution; Frobenius method.

Partial Differential Equations: Formation of PDEs & First order linear PDEs. Solution of PDEs of first order; Lagrange's Method. Second Order homogeneous & non-homogeneous PDEs with constant coefficients. Wave equations. Particular solutions with boundary and initial conditions.

Special Functions: Legendre differential equation and Legendre polynomials, Recurrence relations for Legendre polynomials, Spherical harmonics, Bessel differential equation, Bessel functions, Recurrence relations for Bessel

functions, Modified Bessel functions, Hermite differential equation, Hermite polynomials, Hyper-geometric function. Credits 3; Pre-requisites: MAT 101.

MAT 104: Co-ordinate Geometry and Vector Analysis

Two-Dimensional Geometry: Change of axes, transformation of co-ordinates, Pair of straight lines, Circles:Tangents and Normals, Chord of Contact, System of Circles: Orthogonal Circles. Conic Section: Parabola, Ellipse & Hyperbola. The general equation of second degree, Identification of Conics. Three-Dimensional Geometry: Co-ordinate systems; Direction cosines & direction ratios, Plane, Straight line: The Shortest distance, Sphere: Tangent Plane. Cylinder and Cone.

Vector Analysis: Vectors and Scalars, Algebra of vectors, Vector differentiation and vector integration, Gradient, Divergence and Curl: Cartesian, Spherical, Polar and cylindrical systems, Physical significance of Gradient, Divergence and Curl. Green's theorem, Divergence theorem, Stoke's theorem and their applications. Credits 3; Pre-requisites: None.

MAT 110: Mathematics for Business and Economics I

Set Theory: Basic concepts on sets, Set operations, Venn Diagrams and applications. Linear Equations & Inequalities in one Variable: Solution, Graphs and applications.

Functions & Graphs: Linear functions and straight lines, Quadratic functions and Parabolas, Exponential and Logarithmic functions and their applications in Simple and Compound interest. Effective rate: Growth and Time.

The Derivative: Brief discussion on Limits and Continuity, Rate of change and Slope, Derivatives of functions, Chain rule, Local Extrema.

System of linear equations and Matrices: Matrices and Matrix operations, System of linear equations. The Gauss Jordan Elimination, inverse of a square matrix and solving a system of linear equations by inverse method.

Permutations & Combinations: Fundamental principle of counting, Permutation and Combination. Binomial Theorem: Expansion of the power of a Binomial.

Arithmetic & Geometric Progressions: Determination of the n-th term, common difference, first term and sum of the first n terms of an arithmetic progression. Determination of the n-th term, common ratio, first term, and sum of the first n terms of a geometric progression and Infinite geometric series. Applications. Credits 3; Prerequisite: None

MAT 201: Linear Algebra

Systems of linear equations and matrices: Introduction to systems of linear equations,Gaussian elimination and Gauss-Jordan elimination, Matrices and matrix operations, Inverses; rules of matrix arithmetic, Elementary matrices and a method for finding inverse of a matrix, Further results on systems of equations and invertibility, Diagonal, triangular, and symmetric matrices.

Determinants: Basic concept on determent, Evaluating determinants by row reduction, Properties of the determinant function, Cofactor expansion and Formation of Adjoint matrix; Cramer's rule. General vector space: Real vector space, Subspace, Linear independence, Basis and dimension, Row space, column space and null space, Rank and nullity. Inner product spaces: Inner products, Angle and orthogonality in inner product spaces, Orthonormal bases; Gram-Schmidt process; QR-decomposition, Best approximation; least squares, Orthogonal matrices; change of basis. Eigenvalues and eigenvalues: Concepts on eigenvalues and eigenvalues, Diagonalization, Orthogonal diagonalization. Linear transformation: General linear transformation, Kernel and range, Inverse linear transformations, Matrices of general linear transformations. LU-decomposition: Solving linear system by factorization. Credits 3; Pre-requisites: MAT 102.

MAT 211: Mathematics for Business and Economics II

Economics and business models. Functions. Limits and Continuity. Derivatives: Derivatives of constants, power forms and sums, Derivatives of products and quotients, Chain rule: power form, Marginal analysis in business and economics, First derivatives and graphs, Second derivative and graphs, Optimization: absolute maxima and minima. Integration: Antiderivatives and indifinite integrals, Integration by substitution, Definite integral as a limit of a sum, integration formulas, Area between curves. Partial Derivatives: Functions of several variables, Partial derivatives, Maxima and minima, Constant optimization using Lagrangian multiplier. Credits: 3; Prerequisite: MAT 110, ECO 102

MAT 301: Complex Variables & Mathematical Transforms

Complex Variables: Complex number system, General functions of a complex variable, Limits and Continuity, Complex differentiation, Analytic functions, Cauchy Riemann equations, Necessary and Sufficient conditions. Singularities: Classification of singularities. Line integrals of complex functions, Cauchy's theorem, Cauchy's integral formula, Liouville's theorem, Taylor's and Laurent's series. The Residue theorem, Contour integration, Conformal mapping and its application.

Laplace transform: Definition of Laplace transform, Laplace transform of different functions, Inverse Laplace transform, Convolution theorem, evaluation of improper integrals by Laplace transforms, Solution of differential equation by Laplace transforms.

Fourier Analysis: Fourier series; Dirichlet's conditions, Parseval's theorem, Fourier integral and Fourier transforms. Application of Fourier transforms in solving boundary value problems. Credits 3; Pre-requisites: MAT 102.

MAT 407: Advanced Calculus

Vector differential equations, constant coefficient equations, first-order systems, linear systems. Credits: 3; Prerequisite: MAT 311

MAT 470: Real Analysis

Real and complex number system, basic topology, numerical sequence and series, continuity, differentiation, Rieman-Stieltjes integral, sequence and series of functions. Credits: 3; Prerequisite: MAT 301

MGT 101: Principles of Management

This course introduces the students with basic management concepts, theories and models in effective management and decision making process. It provides an overall conceptual framework that can be used to understand how a manager can influence in the field of management. Particularly, it will review and discuss for better understanding the basics of planning, organizing, controlling, interpersonal relations and leadership/management role in the managerial environment of today. Credits: 3 Prerequisite: BUS 101, ENG 101

MGT 251: Organizational Behavior

Understanding the behavior of employees in organizations, particular attention to motivation to the individuals to join and perform in organizations and to employee satisfaction with element strategies to modify employee motivation and satisfaction. Credits: 3 Prerequisite: MGT 101

MGT 337: Production Operations Management

Topics include: Introduction to production management, consideration of major problems of the production area, and the use of quantitative methods for solving them . Credits: 3 Prerequisite: MAT 110, STA 101, MGT 101

MGT 402: Management Science

Survey of the current literature in Management Science examines principles and practices of scientific management. Selected topics in this course include: MBO, quantitative methods, markov decision problems, simulation and queuing theory. Credits: 3 Prerequisite: STA 327, MGT 101

MGT 405: Organizational Development and Change

Provides an understanding of basics of organizational development, organizational renewal and change, intervention process. The objective of this course is to provide students with an integrated and comprehensive view of the field of organizational development. Credits: 3 Prerequisite: MGT 251

MGT 410: International Labor Management

This course provides an overview of the history and development of labor relations, the structure of union organizations, and process of negotiations and contract administration. Topics include the study of labor management in development market economics, international bargaining, ethics and employee relations. This course is a balanced approach from international or management viewpoint and an analysis from a behavioral, institutional and economic perspective. Credits: 3 Prerequisite: BUS 361, MGT 101

MGT 421: Entrepreneurship Development

This course starts with the evaluation of the available business opportunities. Then it discusses the marketing strategies, financing, controlling process the leagl responsibilities. It concludes with some tips for the future applications and shows the students the need for a business plan. Credits: 3 Prerequisite: MGT 101

MGT 425: Total Quality Management

Examines major issues of TQM principles and theories. Topics include Demings, Jurans, Crrosbys TQM principles, JIT, HRM, Leadership theories, Quality and operational research. Credits: 3 Prerequisite: MGT 101

MGT 437: Small Business Management

Managing small firms is a multidisciplinary activity. Planning activity binds all other activities together. Besides planning the course covers topics, such as: setting up, business basics, finance, control and the growing business. Credits: 3 Prerequisite: MGT 101

MGT 448: Managing Globalization

This course contains topics on organizational strategy : for global competitive advantage ; management dynamics : structuring, staffing, & sharing values ; and cases regarding global management. This course also covers cultural and behavioral aspects of globalization, functional aspects of globalization and socio-ethical issues relating global management. Credits: 3 Prerequisite: ITB 301, MGT 101

MGT 465: Leadership Management

This program responds to the leadership development needs of government and non-government organizations. This program provides a means by which students may discover and refine abilities fundamental to effective leadership. Credits: 3 Prerequisite: MGT 251

MGT 480: Strategic Management

Analysis of policy formulation and implementation from a company wide stand point. Emphasis on integration of knowledge and approaches across functional areas, which affect company policy and the role of the firm in the society. Credits: 3 Prerequisite: 99 credits

MIS 101: Introduction to Management Information System

Introduction to the components of the management information system and their integration for managerial control and decision support. Major functional applications and impacts of information technology on individual and society. Credits: 3 Prerequisite: CSE 101

MIS 305: Enterprise Information System

The aim of this course is to focus on the different perspectives of Information Technology Management and its changes in the 21st century. It will prepare the

students to face the MIS challenges of the new millennium. This course includes different technological matters such as e-business models, value creation and group focusing by using technology. It also includes extended enterprise concept in creating value from different computer based decision making approaches and virtual business concept. Different communication challenges from network perspective are also included. Electronic commerce imperative, MIS dilemmas for managers, unintended consequences of information technology, privacy in the age of the Internet, the global network organization of the future, its transformation, and business education will also be covered.
Credits: 3 Prerequisite: MIS 101

MIS 401: Structural Programming
Introduction to Basic Programming Concepts. Writing Algorithms, Pseudo-Code and developing flowcharts. Coding, debugging and running structured programs using C language: data types, variables, constants, operators and expressions, assignments and type conversion in assignments, control flow, functions and program structure, pointers and arrays, strings, input/output, dynamic variables, etc. The course includes lab works based on theory taught.
Credits: 3 Prerequisite: MIS 305

MIS 402: System Analysis and Design
Essential steps in developing a management information system, Including P-3 preliminary planning, designing, feasibility analysis, implementation schedule, and post implementation review of the systems which familiarizes students with methodology and techniques.
Credits: 3 Prerequisite: MIS305

MIS 403: Object Oriented Programming
The Objective of this course is to introduce the concept of object oriented programming to MIS students. It will include Object oriented concepts: Classes, objects, methods, polymorphism and inheritance with C++/Java. This course will cover syntax, idioms and patterns of C++/Java so that students are comfortable with object oriented programming. It will cover the essentials of the C++/Java class library and introduce event driven Graphical User Interface (GUI) programming. This course includes extensive lab work.
Credits: 3 Prerequisite:MIS 305, MIS 401

MIS 404: Networking and Operating System
The logical and physical design and implementation of computer network. The framework of layered architecture, different protocols, cable types and connectors, network naming and security, wide area networks, network trouble shooting, file systems of Microsoft NT, installing, fault tolerance, WINNT resources, remote access, performance monitor, file systems of UNIX, basic commands, editors, and shell scripts.
Credits: 3 Prerequisite: MIS 305

MIS 406: Relation Database Management System
The logical and physical design of database using computerized tools. Topic include - query optimization, DDL, DML, DCL, keys, joins, triggers, standard SQL functions e.g. count, nvl, sum, order and group by, snap shots, clusters, table space, etc. A great deal of emphasis will be given to query writing using the PL/SQL ; forms and report will be created by using different front end tools.
Credits: 3 Prerequisite: MIS 305

MIS 407: System Integration & Security and Internet
Business and system specification, existing hardware and software platform, file system of different operating systems, integration features of different systems including hardware and software, security features of different hardware and software, history and current management of internet, engines, internet services, electronic business and business promotion, internet software development and security.
Credits 3 Prerequisite: MIS 305

MIS 408: Internetworking with TCP/IP and Implementing Exchange Server
Introduction to TCP/IP, identifying machine with IP routing, IP address resolution, host name resolution, Net BIOS name resolution, DHCP, WING, internet working, browning, connectivity in heterogeneous environments, SNMP services, fine tuning and optimization, trouble shooting, and administration of exchange server.
Credits 3 Prerequisite: MIS 404

MIS 409: Client/Server Administration
Domain model in the enterprise, server managing, uses (local and global) management, resource management, server and client, internet services, internet work routing, system performance, network monitoring, and server and client trouble shooting.
Credits 3 Prerequisite: MIS 408

MIS 410: Database Systems
Fundamental concepts, System organization and implementation of database systems. Relational, hierarchical and network data models. File organizations and data structures. Query languages, query optimization. Database design. Concurrency control. Security issues evolving distributed database systems. The course includes lab works based on theory taught.
Credits: 3, Prequisite: MIS 305

MIS 415: Decision Support System
This course focuses on the fundamentals of decision support system, its tools and implications in present decision making process.
Credits: 3 Prerequisite: MIS 305

MIS 419: E-Commerce and Web Programming
This course focuses on recognizing and explaining electronic business process and identifying and recommending Internet and E-Commerce. Topics include implementation of and conducting E-Business and managing Web: the global and local market, business to

business, Web application, corporate Web server management, legal considerations, Electronic Payment Systems (EPS), role of the bank in E-commerce, business model for E-commerce. It covers Web technology comprehensively.
Credits 3 Prerequisite: MIS 305

MKT 101: Principles of Marketing
Principle of marketing course is designed to give the students an interesting and decision oriented approach to the study of basic marketing concepts and practice. This course provides an integration of marketing activities of the firm into a system, which includes basically product, price, promotion and place.
Credits: 3 Prerequisite: BUS 101, ECO 101

MKT 201: Marketing Management
Management of the firms marketing function within a dynamic operating environment. Includes study of such function as product development, promotion, channel, selection, logistics and market research.
Credits: 3 Prerequisite: MKT 101

MKT 401: Sales Management
Analysis of the management of the sales effort within the marketing system. Philosophies, concepts, and judgment criteria of the sales function in relationship to the total marketing program.
Credits 3 Prerequisite: MKT 201

MKT 405: Promotion Management
The role of promotional activities in the firms marketing function. Topics included advertising, personal selling, sales promotion and publicity. The relationship of consumer behavior to the area of promotion.
Credits 3 Prerequisite: MKT 201

MKT 408: International Marketing
Analysis of international operations. Emphasis on the factors influencing marketing to and within foreign countries and the alternative methods of operations open to international firms.
Credits 3 Prerequisite: ITB 301 MKT 201

MKT 410: Consumer Behavior
Examines underlying psychological, sociological, and economic factors, which influence consumer behavior. Studies and impact of marketing activities on society, consumerism, and legislation affecting the market place.
Credits 3 Prerequisite: MKT 201

MKT 411: Export-Import Management
Export-import procedures/transactions; actors which include the banks, insurers, shippers, clearing & forwarding agents etc associated with export and import activities; documents which include L/C, Shipping Documents, Certificate of Origin, etc required for trade transactions and policies including incentive plan, foreign exchange regulation, export promotion methods, quota, tariffs etc which affect export-import activities will be discussed in this course. Credits 3 Prerequisite: MKT 201

MKT 412: Service Marketing
Characteristics of service industries and organizations, pre-sales and post-sales activities and marketing people in service marketing. The service marketing mix major store and non-store retailing. Managing services quality, productivity, relationships and service marketing etc.
Credits 3 Prerequisite: MKT 201

MKT 414: Marketing Research
The basic procedures and theories appropriate to solving various types of marketing problems in the context of business organization and decision models.
Credits 3 Prerequisite: STA 327, MKT 201

MKT 416: Brand Management
The focus of this course is on formulating and implementing complete marketing programs for successful brand management. The main objective is to provide an in-depth understanding of the role of brands in marketing consumer and industrial goods/services. The course also deals with the key responsibilities of a brand manager and provides the students also with some of the quantitative tools that are helpful to brand managers in analyzing customers and competitors and guiding them in their strategic and tactical decisions. Definition of brand, the nature and evolution of branding, brand image, positioning and repositioning brands, building and measuring brand equity, pricing and promoting brands, brand strategy and brand plans, global branding, protecting the brand.
Credits: 3 Prerequisite: MKT 201

MKT 418: Physical Distribution
Integration of physical distribution activities of the firm into a system. Transportation and location as elements of the system. Inventories and service as constrains upon the system. Planning, operation and management of the system.
Credits 3 Prerequisite: MKT 201

MKT 430: Strategic Marketing
The course discusses marketing strategy, defining and analyzing markets, marketing segmentation, analyzing competition, market targeting and positioning strategies, product portfolio strategy, implementation, and other relevant topics.
Credits 3 Prerequisite: STA 101, MKT 201

PHRM 101: Physical Pharmacy I
The objective is to introduce to the students the basic aspects of physical chemistry having application in Pharmacy which includes different states of matter, solutions, PH buffers, chemical kinetics.
Credits 3, Prerequisite: None

PHRM 102: Cell Biology & Anatomy
This course deals with the molecular and cellular processes that occur for the development of human. The course will give an overview of basic structure and function of cells, steps and histological perspective of human development.
Credits 3, Prerequisite: None

PHRM 103: Organic Pharmacy

The course introduces fundamental aspects of organic chemistry carbon compounds, atom, electronic structure, orbital, bond formation, organic reactions, structure, preparation and properties of aliphatic and aromatic organic compounds and their pharmaceutical and biological uses. The course also undertakes practical chemistry of organic compounds and their identification.
Credits 2+1, Prerequisite: None

PHRM 201: Human Physiology I

The essential concern of physiology is how living things work and, as physiology relates to man, it is the study of the normal functioning of the human body. The course objective is to provide the student with a basic understanding of the specific function of the major organs and systems of the body. The functions of major body systems include Haemopoetic, gastrointestinal, cardiovascular, respiratory, excretory, nervous and reproductive system.
Credits 3+1, Prerequisite: PHRM 102

PHRM 202: Microbiology

This course is designed to introduce students with the historical perspective in terms of major innovations in the field of Microbiology. Basic tool of Microbiology, i.e., Microscopes of various types their principles and uses will be covered. Simultaneously, Morphology, nutritional requirements, growth of bacteria, virus, fungi., mould & yeast will be briefly studied.
Credits 2+1, Prerequisite: None

PHRM 203: Pharmaceutical Analysis -I

The aim of this course is to familiarize students with the knowledge of arts and science of pharmaceutical analysis including various aspects of pharmaceutical calculations & titrimetic methods.
Credits 2+1, Prerequisite: None

PHRM 204: Physical Pharmacy II

The objective of this course is to provide knowledge to the students about the principles of physico-chemical parameters involved in drug formulation process and the factors involved. Specifically to provide knowledge on stability of drugs formulation solutions. Mechanism of degradation by varied process, rate of degradation, formulation approaches dealing with stabilization.
Credits 2+1, Prerequisite: PHRM 101

PHRM 205: Inorganic Pharmacy

The course offers knowledge of various aspects of physical and chemical behavior of inorganic elements, compounds and their application as drugs.
Credits 3, Prerequisite: PHRM 103

PHRM 206: Biochemistry

The course offers topic on biochemical reactions, energy changes, electron transport and oxidative phosphorylation ATP generation. Enzyme, general characteristics, active sites, enzyme kinetics, enzyme mechanism of action, competitive and non-competitive inhibition, vitamins, functions, classification and structures, co-enzymes and co-factors. This will provide insight to more advance level study of biochemical study. This course is accomplished with related laboratory classes on Biochemistry.
Credits 3+1, Prerequisite: PHRM 103

PHRM 207: Pharmacognosy I

Theoretical and applied course designed to acquaint the student with the isolation, identification of biologically active natural products. Pharmaceutical use of different phytoconstituents with existing plant classification systems will be discussed in this course.
Use of microscopic methods in the identification of different parts of plants, plant constituents and herbal products, procedures useful for the isolation and characterization of natural drugs has been included in related laboratory experiments.
Credits 2+1, Prerequisite: None

PHRM 208: Human Physiology II

This course will deal with the transport, metabolism (wherever applicable) of major biomolecules e.g., carbohydrates, lipids, proteins and nucleic acids including their building blocks (monomers). Mechanism of action of hormones; physiological role of different hormones; regulation of hormone secretion; different hormonal disorders and their control will also be discussed.
Credits 2+1, Prerequisite: PHRM 102, PHRM 201

PHRM 209: Statistics for Pharmaceutical Sciences

The aim of the course is to equip students with the basic statistical knowledge that can be applied to problems typical of pharmaceutical manufacturing, quality assurance and research.
Credits 3, Prerequisite: None

PHRM 210: Pharmaceutics I

The course will provide the student with a basic knowledge of pharmaceutical dosage forms and drug delivery systems. The course will cover solutions, parenteral delivery systems, disperse systems, solid dosage forms, dosage forms applied to the skin, formulation of dosage forms, and the processes and equipment in their large-scale manufacture.
Credit 2+1, Prerequisite: None

PHRM 301: Pharmacology I

The course deals with basic pharmacologic principles applicable to all drugs. It describes appropriate strategies for monitoring the expected effects and potential adverse effects of medications prescribed Principles of drug action; receptor classification and quantization; dose-response relationships; cellular mechanisms of drug action.
Credits 3, Prerequisite: PHRM 208

PHRM 302: Medicinal Chemistry I

This course has been developed to give students knowledge of designing and synthesizing medicine for the targeting and treatment of ailment. The course encompasses the chemistry of medicine including structure activity relationship, biochemical and physiochemical properties of different therapeutic classes of medicines.
Credits 3, Prerequisite: PHRM 206

PHRM 303: Pharmacognosy II

Its scope includes the study of the physical, chemical, biochemical and biological properties of drugs, drug substances, or potential drugs or drug substances of natural origin as well as the search for new drugs from natural sources.This course includes phytochemistry and pharmaceutical uses of the plant constituents like glycosides and glycoside containing drugs, alkaloids, volatile oils and related terpenoids, Phenolic compounds and tannins, resins.
Credits 3+1, Prerequisite: PHRM 207

PHRM 304: Medicinal Chemistry II

The course aims to provide an advance understanding and appreciation of medicinal and chemical sciences by detailed studies of modules selected from the fields of biology, biomedical sciences and chemistry. The emphasis is firstly on synthesis, structure and analysis of organic molecules and biomolecules and secondly on their participation in the metabolism of and interaction with living organisms.
Credits 2+1, Prerequisite: PHRM 302

PHRM 305: Pharmaceutical Microbiology

This course offers a general overview of the applied aspects of microbiology including sterilization processes, sterility tests of various pharmaceutical products, aseptic techniques and immunological preparations.
Credits 2+1, Prerequisite PHRM 202

PHRM 306: Pharmacology II

Drugs, which are exceptions to, or variations from, prototypes, are emphasized. The course emphasizes drug therapeutics, side effects, toxicity, precautions, contraindications and interactions both in vivo and in vitro. How knowledge of basic pharmacology can be used to assess drug manufacturers' claims is included in the laboratory course.
Credits 3+1, Prerequisite: PHRM 301

PHRM 307: Industrial Pharmacy-I

This course is intended to introduce to the students the major three aspects of industrial manufacturing of drugs, product development, management and communication skill. This will include practical training in industry. It is desired that student should be familiar with the manufacturing equipments and process, quality control, in-process control and finished products. Understand Good Manufacturing practice (GMP), QA and QC, storage of raw materials, entry and distribution, able to follow Standard operating process (SOP), and the flow of manufacturing process.
Credits 3, Prerequisite: PHRM 210

PHRM 308: Pharmaceutics II

The study and application of physicochemical principles to the design, formulation, and effective use of dosage forms to assure product performance and achieve the desired therapeutic outcomes in the body. Emphasis has been placed on rationale for design, intended performance characteristics, and proper use of dosage forms.
Credits 3+1, Prerequisite: PHRM 210

PHRM 309: Pharmaceutical Analysis II

The objective of the course is to equip the students with the knowledge of pharmaceutical analysis of the dosage forms following more precise methods.
Credits 3+1, Prerequisite: PHRM 203

PHRM 310: Toxicology

This course offers toxicity and/or poisoning of heavy metals, organic compounds, carcinogens, environmental toxins etc. Mechanism of cytotoxicity of these toxins/poisons, toxicokinetics, responses of different organs to these toxins/poisons will be covered with toxicity tests (laboratory) for different types of toxins.
Credits 3, Prerequisite: PHRM 301

PHRM 311: Clinical & Hospital Pharmacy

The course is introduced to understand the philosophy of pharmacy practices in general and specifically the health care, role in the health care, pharmacy services, pharmacist professional issues: documentation, prescriptive authority, drug information and literature evaluation - drug information filling system. The opportunities of pharmacist in community and institution, industry, Government, association and more involvements in emergency medical treatment, pharmacy administration.
Credits 3, Prerequisite: PHRM 310

PHRM 401: Pharmaceutical Management and Marketing

This course has been designed to give an overview on a method of critical thinking about marketing and decision making of medicine, critical analysis of the pharmaceutical product marketing process and the firms' environment. The course also discusses the role and purpose of marketing activities within an Pharmaceutical Organization, the social and environmental impact of marketing activities, the ethical dilemmas faced by marketing decision makers in medicomarketing activities. International Pharmaceutical business, effective sales management & management marketing planning.
Credits 3, Prerequisite: PHRM 307

PHRM 402: Industrial Pharmacy -II

The course is introduced to educate the students regarding the practical set up and problems associated with the production floor. The types of machinery used for the various production process starting from raw

materials, packaging materials, water, operators handling of materials inventory to finished product will be covered inclusive safety, health and environment of the plant. The manufacturing of bulk drug and their quality control may be undertaken in this course.
Credits: 3 + 1, Prerequisites: PHRM 307

PHRM 403: Drug Design and Development
The objective of the course is to understand the principles of drug design and development. The sourcing from natural resources extraction and random screening are important step. In development Molecular modification and stereo-chemical aspects are essential because of the specificity of drug action. Molecular modification involves chemistry of association, changes in dimension, flexibility, ring closure and opening, removal or addition of bulky group and introduction of double bonds. In stereo-chemical aspects it deals with optical isomer, disstereomers, conformational isomers and geometric isomers.
Credits: 3, Prerequisite: PHRM 304

PHRM 404: Pharmaceutical Research
The course is introduced as a means of providing an opportunity for exposure to investigational research. The course is designed principally helping students in practicing the research pattern to help them pursue graduate studies. The student undertakes a research project and writes up a report in a research paper format.
Credits 5, Prerequisite: Minimum 60 Credits

PHRM 405: Pharmacy Quality Assurance
The course is designed to provide training for the qualitative and quantitative analysis of drugs starting from raw, packaging materials to finish products including in process quality control and CGMP.
Credits 3, Prerequisite: PHRM 307

PHRM 406: Biopharmaceutics & Pharmacokinetics
This course explores how the fate of drugs in the body is influenced by physiological and biochemical processes. It will give an overview of compartmental and non-compartmental description of the time course of drug action in human body.
Credit 3, Prerequisite: PHRM 308

PHRM 407: Pharmaceutical Biotechnology
The course offers modern biotechnological approaches like recombinant DNA technology, gene therapy, antisense oligonucleotide therapy, vaccine technology, gene cloning will be introduced in terms of their innovations, uses/applications for pharmaceutical purposes.
Credits 3, Prerequisite: PHRM 305

PHRM 408: Safety, Health & Environment
The objective of this course is to understand the causes of environmental pollution such as toxic gases, suspended particles and heavy metals and anti oxidants. Emphasis will be made on hazardous aspects of pollutants generated from formulation of different dosages forms and industrial solid, liquid and effluents. The workers safety and safety and health aspects will be monitor and control.
Credits: 3, Prerequisite: PHRM 202, PHRM 301

PHRM 409: Advanced Pharmaceutical Analysis & QC
The objective of this course is to orient students with various instruments and make understand the principles of operation and uses of these techniques. The instrument include: UV and visible spectroscopy, infrared spectroscopy, mass spectrometry, nuclear magnetic resonance spectroscopy and x-ray crystallography and others for pharmaceutical analysis. Also the students are introduced to learn about different advance techniques of chromatography for separation and identification and dose assessments. The various advance separation techniques include Column chromatography, paper, thin layer and Gas chromatography, HPLC etc. Credits: 3+1, Prerequisite: PHRM 309

PHRM 410: Pharmacy Laws and Ethics
This course is introduced to offer insights of Statute Law, Common Law; Laws of Professional responsibility and Liability, Insurance, Discipline, Confidentiality, Malpractice, Negligence etc. Students will also learn (a) Food and Drug Act, Schedules, and Regulations (b) Narcotic Control Act, Schedules and Regulations (c) Hazardous Products Act (d) Pharmacist Regulations of Excise Act. Other major headlines cover issues on: moral philosophy and ethical principles, professional ethics, code of conducts, Pharmacist's rights and duty to ensure rational and efficient drug utilization, patients rights (autonomy), socioeconomic concerns-conflict between service to the patient, justice (or fairness), costs encountered in the delivery of health care, government, management, ethical Practice - quality assurance conflict resolution, conforming to ideals, barriers - time, money, subservience to physicians, consumer expectations.
Credits 3, Prerequisite: PHRM 405.

PHRM 411: Cosmetology
The course offers concepts of designing various cosmetics preparations in small & large scale including their quality control. Credits 2+1; Prerequisites: PHRM 307

PHY 100: Introductory Physics
Vectors: Concepts of vectors and scalars; algebra of vectors, differentiation and integration of vectors, gradient, divergence, and curl.
Force and Motion: Newton's laws of motion; frictional force, motion in more than one-dimensions; uniform circular motion; work, energy and power, linear momentum, angular momentum and torque, Newton's law of gravitation, Kepler's laws.
Waves and Oscillatins: Simple harmonic motion; damaped harmonic motion; forced oscillation and resonance; different types of waves; interference of waves; standing waves and resonance; Doppler Effect.
Electricity: Electric charge and Coulomb's law; electric

field and electric potential; electric dipole, electric current and Ohm's law.

Magnetism: Biot-Savart Law, Ampere's law; solenoid and toroid; Faraday's law of electromagnetic induction.

Optics: Light as electromagnetic wave; reflection and refraction of light; total internal reflection; interference of light; Michelson interferometer, diffraction of light; polarization of light. Credits: 3; Pre-requisites: MAT 101.

PHY 101: Physics I (Mechanics, Waves & Thermodynamics)

Vectors: Algebra of vectors; calculus of vectors; gradient, divergence and curl. Mechanics: Force and momentum, Newton's laws, work and energy, conservation of momentum involving friction, simple rotational systems; elasticity and its different modulii.

Introduction to Fluid Mechanics: Basic principle of hydrostatics and streamline fluid flow relating to buoyancy, forces in hydraulic systems, Bernoulli's principle; surface tension and viscosity.

Waves: Different types of waves; harmonic motion in simple vibrating systems damped and forced oscillations, wave propagation and transmission of vibrations and sound, Doppler effect.

Thermodynamics: Concept of temperature and zeroth law of thermodynamics; first law of thermodynamics and its application; isothermal and adiabatic relations; work done by a gas; kinetic theory of gases; Vander Waals equation of state; second law of thermodynamics - reversible and irreversible processes; Carnot cycle; Carnot's theorem; concept of entropy.
Credits: 4; Pre-requisites: MAT 101.

PHY 102: Physics II (Electricity, Magnetism & Physical Optics)

Electricity: Concept of electric charge, conductors and insulators, permittivity of a medium, Coulomb's law, the electric field, lines of force, dipole in an electric field, electric flux, Gauss' law, electric potential, relation between electric potential and electric field, capacitance, calculation of capacitance, different types of capacitors, capacitors with dielectric, energy storage in an electric field, charging and discharging of a capacitor, time constant.

Magnetism: Permeability of a medium, the magnetic field, Biot-Savart law, Ampere's law, magnetic force on a current, magnetic lines of induction, force between two parallel current carrying conductors, Electromagnetic Induction: Faraday's law, Lenz's law, self and mutual induction, and transient response in LR circuit.

Physical Optics: Light as electromagnetic wave; reflection and refraction of light; total internal reflection; interference of light, interference fringes, Michelson interferometer, Newton's ring; Fresnel and Fraunhofer diffractins, diffraction by single slit, diffraction by double slits, diffraction gratings and its resolving power; polarization of light, different types of polarization, Nicol's prism, and optically active materials.

The course includes lab work based on theory taught.
Credits: 4; Pre-requisite: MAT 101.

STA 101: Introduction to Statistics

Definition and Scope of Statistics, Variables, Levels of Measurements, Qualitative and Quantitative Data, Population and Sample, Construction of Table, Frequency Distribution, Graphical Presentation of Data: Bar Diagram, Pie Diagram, Line Diagram, Frequency polygon, Histogram, Cumulative Frequency Polygon, Scatter Diagrams, Measures of Central Tendency: Arithmetic Mean, Median, Mode, Geometric Mean, Related Positional Measures: Quartile, Percentile and Decile, Measures of Dispersion: Range, Mean Deviation, Variance, Standard Deviation, Skewness and Kurtosis, Basic Concepts of Probability, Probability Laws, Independence, Conditional Probability and Mathematical Expectations, Bayes Theorem, Basic Concepts of Discrete and Continuous Probability Distributions: Binomial, Hypergeometric, Poisson and Normal Distributions, Simple Correlation and Regression.
Credits 3; Prerequisite: MAT 110

STA 102: Statistics and Probability

Introduction: Nature and scope, nature of statistical data, Attributes and variables, Discrete and continuous variables, Methods of data collection, Tabulation, graphs and diagrams; Measure of location: characteristics of an ideal measure, Arithmetic mean, Geometric mean, Harmonic mean, Median, Mode, Quartiles, Deciles, Deciles, Percentiles; Measure of dispersion: Absolute measure, Relative measure, Range, Standard deviation, Mean deviation, Quartile deviation, Co-efficient of dispersion, Co-efficient of variation, Skewness and kurtosis; Regression and correlation: relation between variables, Fitting of regression lines, Simple correlation, multiple correlation and regression; Theory of probability; Theorems of total, compound and conditional probability, Random variables Bayes theorem, Discrete and continuous random variables, Probability function, Expectation of sum and products, Concept of Binomial, Poisson amd Normal distribution, Random process, Auto correlation function of a random process, multiple random process, Basic concepts of discrete and continuous probability distributions, Markov process, Queuing process; Sampling techniques; Test of significance: Test of means, Variance, Correlation coefficients and regression coefficients.
Credits 3; Pre-requisites: None.

STA 217: Statistics For Business and Economics

Introduction to modern theory and methodology of statistics in areas of economics and business. Topics include: sampling theory and methodology of sampling distributions and hypothesis testing, contingency tables, multiple regression, analysis of variance, decision theory, index number and time series analysis.
Credits: 3; Prerequisite: MAT 311, STA 101

EWU Faculty Members

Faculty members are chosen through a rigorous selection process. Applications are first scrutinized at the department level, and then processed through an Appointment Committee of the university. Acting on the recommendations of the Appointment Committee, the Board finally appoints Faculty members.

At the moment about 80% of the Faculty members of East West University work full time. List of Faculty members is shown below:

Professor

Mr. Mohammad Musa
Ph.D., (Finance), University of Wisconsin-Milwaukee, USA
MBA (Finance), University of Wisconsin-Madison, USA
MSS (Economics), University of Dhaka

Mr. Abdul Mannan
MBA (Marketing), University of Hawaii, Hawaii, USA
M.Com (Management), University of Dhaka

Mr. Fakrul Alam
Ph.D. (University of British Columbia), Canada
MA (Simon Fraser)

Mr. Md. Mozammel Huq Azad Khan
Ph.D., (Computer Science & Engineering)
Bangladesh University of Engineering & Technology
M.Sc. Engg. (Computer Engineering)
Bangladesh University of Engineering & Technology

Mr. M. Shahidullah
Ph.D., (ELT), University of Pune
MA (ELT), Thames Valley University, London
DIP TEFL, University of Sydney, Australia

Mr. Md. Saleh Uddin
Ph.D. (Economics) University of Malaya, Kuala Lumpur
M.A. (Economics) Chittagong University
M.A. in Economics, Thammasat University, Bangkok

Mr. Md. Abdul Hye
Ph.D. in Accounting, University of Dhaka.
M.Com. in Accounting, University of Dhaka

Mr. Mohamed Ruhul Amin
Ph.D. in Plasma Physics, University of St. Andrews, UK
M.Sc. in Physics, Jahangirnagar University

Ms. Rebecca Sultana
Ph.D., (Postcolonial Theory and Literature)
Texas Christian University, Fort Worth, Texas, USA
M.A. (English Literature) Chittagong University
M.A. (American Literature) University of Texas at Dallas

Mr. Abu Saleh Abdun Noor
Ph.D., The Flinders University of
South Australia, Adelaide, Australia
M.Sc. in Mathematics, Rajshahi University

Syed Akhter Hossain
Ph.D. in Applied Bio-Chemistry, Food and Nutrition
Department of Food Science, School of Agriculture
Sutton Bonington, University of Nottingham (UK)
M.Sc. In Bio-Chemistry, University of Dhaka

Mr. A K Enamul Haque
Ph.D. in Natural Resource Economics
University of Guelph
M.Sc. In Agricultural Economics, University of Guelph
MSS In Economics , University of Chittagong

Mr. Bidyut Kanti Datta
Ph.D. (Pharmaceutical Technology)
Jadavpur University, Calcutta, India
M.Sc. (Biochemistry), University of Dhaka

Ms. Nasreen Wadud, Ph.D.
Ph.D. in Psychology, University of Delhi, India
M.Sc. In Psychology, University of Dhaka

Syed Shahadat Hossain
Ph.D. in Statistics
Deakin University, Australia
M.Sc. In Statistics, University of Dhaka

Mr. M M A Hashem
Ph.D. in Artificial Intelligence Systems
Saga University, Japan
M.Eng. In Computer Science
Asian Institute of Technology, Thailand

Associate Professor

Mr. Asit Roy Choudhury
Post-graduate Diploma in TESL/TEFL
University of Wales, UK

Mr. Md. Ershadul H. Choudhury
M.Sc. (Computer Engineering)
Texas A & M University College Station, USA
B.Sc. (E.E). BUET, Dhaka

Mr. S I Nusrat A Chaudhury
MS (USSR), MBA (Finance)
Keller Graduate School of Management
Chicago Illinois, USA

Mr. Tanbir Ahmed Chowdhury
Ph.D. (Financial Management & Quantitative Techniques)
Pune University, Poona, India

Syed Akhter Hossain
B.Sc (Hons), First Class (First), Gold Medallist
M.Sc (Applied Physics & Electronics)
Rajshahi University

Mr. Abdus Sattar
Ph.D (Statistics)
Kiev Institute of National Economy Kiev, Ukraine
M.S. (Economics) Odessa Institute of National Economy
Odessa, Ukraine

Syed Anisul Haque
Ph.D. in Materials Science, JAIST, Japan
Postgraduate Diploma in Computer Science
Cambridge University, England
M.Sc. in Applied Physics & Electronics, RU

Mr. Md. Abdul Wadud
Ph.D. in Economics
University of Newcastle upon Tyne
MSS in Economics, University of Rajshahi

Assistant Professor

Mr. Kazi Khaled Shams Chisty
MBA Columbia State University, USA

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Mr. Harunur Rashid Khan
M. A (Applied Linguistics)
Victoria University of Wellington, New Zealand
Post Graduate Diploma in TESOL
University of Canberra, Australia
MA (English Literature), Jahangirnagar University

Mr. S. S. M. Sadrul Huda
Master of Science, Leisure & Environment
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