INTRODUCTION

Industrial Engineering and Management Engineering is related with the application of techniques and principles to the improvement, design, and installation of systems that involve people, materials, information, energy, money and equipment to provide efficient production of goods and services. To evaluate and work with these systems, knowledge and skills in the mathematical, physical, and social sciences are required. Industrial/Management Engineering activities form a bridge between management goals and operational performance. The Industrial/Management Engineers are more concerned with increasing productivity through the management of people, methods of business organization, design and analysis of processes, and technology than the engineers in other specialties, who generally work more with products.

Industrial/Management Engineers are employed in multidisciplinary teams, and usually concerned with the planning, installation, controlling and improvement of production activities. Such activities may include manufacturing, product innovation, provision of services, transportation, and organizational information flow. Industrial/Management Engineers may seek employment in organizations such as government, manufacturing industry, construction sector, extractive industry, educational institutions, research and consulting institutions, and service industry including healthcare units, banks, insurance and utility companies.

Although the Department produced its first graduates only in 1998, the graduates have already been significantly serving to the global society. They are providing contributions to the most known international companies and universities in the United States, Canada, United Kingdom, Germany, Italy, Austria, Belgium, Norway, Netherlands, United Arab Emirates (UAE), Qatar, Kuwait, Iran, China, Pakistan, South Korea, Turkey, Cyprus and so forth. It is worth mentioning that many graduates have completed their MS/MBA/PhD degrees in prominent universities in USA, Europe and far-east Asia where some of them are serving as university instructors in all around the world. Several graduates are admitted to full scholarship graduate programs at the most prominent universities such as Massachusetts Institute of Technology (MIT-Boston-USA), and University of Cambridge (UK).

The Department of Industrial Engineering was founded in 1994 as the youngest department in the Faculty of Engineering under the guidance of the professors Peter Kas, Sinan Kayalıgil, and Kudret Yurtseven. The founder chair during the academic years 1994-1998 was Assoc. Prof. Dr. Kudret Yurtseven who was later on succeeded by Assoc. Prof. Dr. Nureddin Kirkavak, and by Prof. Dr. Gökhan İzbırak.

After the start of education in Fall 1994-95 with a single undergraduate program, namely Industrial Engineering, the Department then launched a number of new programs in both undergraduate and graduate levels in the following order: MS in IE (with thesis, started in 1998-99), PhD in IE (started in 2002-03), BS in Management Engineering (started in 2011-12), MS in IE (without thesis, started in 2013-14), MS in Engineering Management (without thesis, started in 2014-15). The Department also runs two Minor programs and two Double-Major programs for its undergraduate students. Since 1998 there had been more than 1,400 individuals graduated at various degree levels.

The Department of Industrial Engineering currently has 3 Professors, 3 Associate Professors, 2 Assistant Professors, 3 part-time lecturers and 11 research assistants. The present number of registered students in the Department has exceeded 400 and approximately 100 new students each academic year are admitted to the Department. The Industrial Engineering undergraduate program is accredited by ABET and accreditation process of Management Engineering undergraduate program is underway.

Cosmopolitan student profile is one of the strengths of the Department. More than 80 percent of the students are international, *i.e*. other than Turkish Cypriots and Republic of Turkey citizens. Diverse student population is coming from 35 different nationalities, of which 30 percent are women. The number of students, in descending order of enrollment, are coming from the following nationalities; Jordan, Turkey, Iran, Syria, Nigeria, Palestine, Yemen, TRNC, Egypt, Morocco, Sudan, Lebanon, Pakistan, Libya, Iraq, United States, Eritrea, Kenya, Azerbaijan, Kazakhstan, Kongo, Germany, Algeria, Indonesia, Tanzania, Tunisia, Kyrgyzstan, Zimbabwe, Georgia, Turkmenistan, Lesotho, China, Zambia, Namibia and Nepal.

The undergraduate programs provide an interdisciplinary educational foundation for its graduates to understand, find and implement solutions with a system approach. Students are provided with the essential tools to consider the technological, business and human aspects of problems in complex systems. Graduates of the programs are prepared for employment in technologically and socially complex organizations, or for pursuing their research interests at graduate level. The graduate programs leading to MS and Ph.D. degrees are designed to provide the students with a strong analytical basis for advanced theoretical work or for development of new approaches to applications, and to promote fundamental graduate research in the relevant areas with scientific and technological developments..

Responding to the demand of enrolment to the programs, the Department will continue its growth by employing qualified faculty members and enhancing its research activities. The Department is preparing itself to meeting the challenges of globalization in the next decade and after.

Vision
Our vision is to be the department with most sought after graduates by top organizations through excellence in teaching and research.

Mission
Our mission is to provide a scholarly environment to generate and disseminate new knowledge and technological innovation through research, and to equip future engineers with sound professional background for the benefit of the society.

Educational Objectives of Industrial Engineering
The graduates of IE undergraduate program, within few years of graduation, are expected to attain the following:
1. Have successful careers in industry, government, or academia.
2. Demonstrate professional growth, leadership, and ethical and social responsibility within organizational, societal, and global contexts.
3. Practice their profession independently or collaboratively across disciplines and cultures.

Educational Objectives of Management Engineering
The graduates of MANE undergraduate program, within few years of graduation, are expected to attain the following:
1. Practice their profession successfully in the management of all types of organizations
2. Acquire and use new knowledge and professional skills in the field of Management Engineering
3. Deliver positive change locally, regionally and globally by demonstrating economic, social civic, ethical and environmental responsibility
4. Be able to demonstrate leadership and collaborate in multicultural and multidisciplinary teams

Student Outcomes
By the time of graduation, the students of IE & MANE undergraduate program are expected to attain the following skills, knowledge, and behaviors:
1. an ability to identify, formulate, and solve complex engineering problems by applying principles of engineering, science, and mathematics
2. an ability to apply engineering design to produce solutions that meet specified needs with consideration of public health, safety, and welfare, as well as global, cultural, social, environmental, and economic factors
3. an ability to communicate effectively with a range of audiences
4. an ability to recognize ethical and professional responsibilities in engineering situations and make informed judgments, which must consider the impact of engineering solutions in global, economic, environmental, and societal contexts
5. an ability to function effectively on a team whose members together provide leadership, create a collaborative and inclusive environment, establish goals, plan tasks, and meet objectives
6. an ability to develop and conduct appropriate experimentation, analyze and interpret data, and use engineering judgment to draw conclusions
7. an ability to acquire and apply new knowledge as needed, using appropriate learning strategies

Students will be prepared for engineering practice through a curriculum culminating in a major design experience based on the knowledge and skills in earlier course work and incorporating appropriate engineering standards and multiple realistic constraints. The curriculums will prepare graduates to design, develop, implement, and improve integrated systems that include people, materials, information, equipment, money and energy. The curriculums include in-depth instruction to accomplish the integration of systems using appropriate analytical, computational, and experimental practices.

Academic Integrity

The Faculty of Engineering takes academic honesty and ethical behavior very seriously. Engineers are entrusted with the safety, health, and well-being of the public. Students found guilty of academic dishonesty will be punished to the full extent permitted by the rules and regulations of the Eastern Mediterranan University. In particular, any student found guilty of a second offense by the Student Disciplinary Board will be subject to dismissal from the University.

COMPUTER ACCOUNTS

Students have two types of computer accounts in the labs; iestudent and guest. All new students should contact to System Administrator Mr. Necat ABDULLAHOGLU to get their new e-mail and portal account passwords at the beginning of their first semester. Students should check their e-mails regularly to determine what events of interest are occurring, e.g., seminars, course announcements, etc. E-mail should also be the primary channel of communication with faculty members and students whenever oral communication is not possible.

CONTACT DETAILS

Department web site: https://ie.emu.edu.tr/en

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Gazimağusa, Turkish Republic of Northern Cyprus (T.R.N.C.) – ZIP Code: 99628
(via Mersin 10, TURKEY)

Tel: +90 – 392 – 630 13 18
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E-mail: iedept@emu.edu.tr

Facebook (closed group): https://www.facebook.com/groups/116411338757882/

Group can also be searched as "Current EMU-IE Students"
To be accepted to the group the questions must be answered.

FACULTY MEMBERS

Full-Time

Bela VIZVARI: *Distinguished Professor.* BS, MS, PhD: Eötvös Loránd University; Dr. sc. nat. Institute of Technology "Carl Schorlemmer"; C.Sc., Hungarian Academy of Sciences; Dr. Habil, Eötvös Loránd University. *Research interests*: Integer Programming, Schedule Theory, Agricultural Economics, Production Control.
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INDUSTRIAL TRAINING

In partial fulfillment of the BS degree requirements in Industrial Engineering and Management Engineering, students are required to complete 3 (three) Industrial Training (IT) practices. The course titles corresponding to each Industrial Training are: IENG210/MANE200 (Industrial Training–I, minimum 10 working days), IENG310/MANE300 (Industrial Training–II, minimum 15 working days) and IENG410/MANE400 (Industrial Training–III, minimum 20 working days and requires submission of 2 reports). Industrial Trainings are normally performed during Summer periods, but if the duration permits it can also be done during Winter Breaks too. Note that students registered to courses in the Summer School cannot perform their training in *parallel* with the Summer School. Such students should perform their trainings either before or after the Summer School, if the durations permit. Each Industrial Training course is a Pre-requisite to the next Industrial Training course.

Students are registered to the Industrial Training courses only after they complete their trainings and submit their **Log-Books** to the Department Secretary **latest** at the *Last Day for Course Add/Drop* period (the period is specified at the Eastern Mediterranean University Academic Calendar: https://www.emu.edu.tr/en/academics/calendar/1336). In order not to receive an "NG" grade from the registered training course, students should submit the following **latest** by the *Last Working Day Before the Midterm Examinations* period (Midterm Examinations period is specified at the University Academic Calendar too) to Mr. Sayed Davood Forghani (Office: B109, email: davood.forghani@emu.edu.tr): (1) A hard copy of the report, (2) its softcopy in word format, (3) a proof of Turnitin similarity check, and (4) Acceptance and Completion letters sent earlier by the company where the training was performed. **Note 1.** Students without IT Application forms (which is the first step of the procedure) will fail from the training ("U" grade will be given). **Note 2**. A student may be asked to present their report orally if the report evaluator finds it necessary.

For training outside of TRNC, it is the responsibility of the students themselves to find an **acceptable company**. Since companies provide limited places for the trainee students, students should start searching for acceptable companies as soon as possible. For training in the TRNC, visit the Department Secretary after the Midterm Examinations period.

An **acceptable company** should satisfy the following criteria:

- IENG210/MANE200: A "discrete-part manufacturing" (*) company or a company in "process industry (**) with at least 50 personnel of which minimum 2 Engineers (from any discipline). Duration = minimum of 10 working days.

- IENG310/MANE300: A "discrete-part manufacturing" (*) company or a company in "process industry (**) with at least 50 personnel of which minimum 2 Engineers (at least one should be **IE or MANE**). Duration = minimum of 15 working days.

- IENG410/MANE400: A "discrete-part manufacturing" company, or "process type production" (**) company, or a "service production" (***) company. For "discrete manufacturing" or "process type production" companies, there should be at least 50 personnel of which minimum 4 Engineers (at least one should be **IE/MANE**). For "service production" companies there should be at least 25 personnel of which 4 Engineers (at least one should be **IE/MANE**. For the remaining 3 engineers, **MBA** holding professionals can also be accepted). Duration = minimum of 20 working days.

(*) **Discrete-part manufacturing** involves assembling (*e.g.* automotive/white goods/electronics/furniture/water pumps/lighter/machine parts/A/C/elevators/house products etc.).

(**) **Process industry** (*e.g.* milk/coke/ayran/beer/wine/oil/cheese/biscuit/chewing gum/hot dog/salt/sugar/shapoo/soap/jewellery/fertilizer/textile/weaving/paint/paper/petroleum/timber/medical drugs/cosmetics/pharmaceuticals/chemical/iron/steel/tube/glass/ceramic/cement/pipe/rubber/tire etc.).

(***) **Service sector** (*e.g.* banking/consulting/finance/health/tourism/software/transport/hospitals/ communication (Turkcell/Vodafone etc.)

Application procedure for Industrial Training

Students should follow the following steps:

1. Find an acceptable company that will allow you to perform your training outside of TRNC.
2. Take the IT Application Form from the Secretary, fill it, and go to Department Chair to get approval for the company you found (you can propose at most 3 companies in the Form). After approval, the Form should be submitted back to the Secretary. Industrial Trainings performed in the companies without Departmental approval is **not** accepted.
3. After the approval of the company, you should ask the company to send us an official document (an e-mail to gokhan.izbirak@emu.edu.tr sent from official company e-mail account) stating that; you are "accepted", and the exact dates of your training.
4. After completing the training, the company should send us another document stating that you have "completed" the training.
5. Some companies may ask you to provide a document proving that "you are a student". No problem! Just ask our Secretary to prepare it for you.
6. If you are going to perform your training in **Cyprus** or **Turkey**, due to "student trainee insurance law", you should fill 3 copies of "Compulsory Internship Form" (in Turkish, "Zorunlu Staj Formu") that can be downloaded from the following link: (https://ie.emu.edu.tr/en/department/industrial-training). Each of these forms must have; personal photos attached (you can copy-paste too), filled-in electronically (not hand written), and must be signed by both Department and Dean of Faculty of Engineering. Additionally 3 copies of - your passport's relevant pages (for international students) / Identity Card (for Turkish students) - is required. After getting approvals of all these documents, one copy of them will be kept in the Department and you will submit the other 2 copies to the Registrar Office. **For the citizens of Turkey only:** Students from Turkey additionally have to provide 3 copies of *Müstehaklık Belgesi* as well (this document can be downloaded from https://www.turkiye.gov.tr/spas-mustahaklik-sorgulama, website requires password).
7. Students should obtain Industrial Training (IT) **Log-Book**, and IT **Booklet** from Deniz Shop before leaving for the training. Log-Books should be stamped by the Department Secretary. All the Questions and Tasks to be answered for each training are provided separately at the back of the Log-Book. Here you will also find the Chapter and Section headings that must be used while writing your Report (you should add Coverpage and Table of Contents). To learn the details about **report writing** visit our website: https://ie.emu.edu.tr/en/others/report-writing

The Last Training (IENG410/MANE400)

The **last** training requires submission of two Reports; one for the Questions & Tasks, and the second Report for the selected IE/MANE PROBLEM in the company. Here, a student must find a real, potentional or hypothetical problem related to IE/MANE discipline and propose a solution by using techniques discussed in the curriculum courses. Other than cover page, Table of Contents, Introduction, Conclusion, References, Appendix, at least the following chapters (1) Problem Identification, (2) Problem Definition, (3) Problem Formulation (including assumptions), (4) Development of Solution Alternatives, (5) Evaluation of Alternatives, Selection and Proposing a Satisfactory Solution, Analysis of Results and Discussion of the Proposed Solution must be included in the Report

After the training

The Log-book (filled by the mentoring engineer at the company) must be submitted to the Department Secretary **latest** at the *Last Day for Course Add/Drop* period specified at the University Academic Calendar: https://www.emu.edu.tr/en/academics/calendar/1336. Then the Secretary will give you a formal paper (notifying that you have done your training) that you should immediately submit to your Academic Advisor in order to register you to the Industrial Training course. Otherwise you will not be able to register to the relevant IT courses.

In order not to receive an "NG" grade, the following materials should be submitted to Mr. Sayed Davood Forghani (Office: B109, email: davood.forghani@emu.edu.tr) **latest** by the *Last Working Day Before the Midterm Examinations* period (Midterm Examinations period is specified at the University Academic Calendar):

- A hard copy of your report (2 reports for the **last** training)
- Softcopy of the report in word format
- *Turnition* similarity check.
- Acceptance and Completion letters sent earlier by the company where the training was performed.

Note: Students without IT Application forms (which is the first step of the procedure) will fail from the training ("U" grade will be given).

Evaluation and Grading of Industrial Training reports

Evaluation of the report is done on a Pass (S) / Fail (U) basis and based on

a) the student's observations and responses to the Questions & Tasks listed in the Log-Book (+),
b) the Format of the Report (https://ie.emu.edu.tr/en/others/report-writing),
c) the Academic English used throughout the Report,
d) the **last** training (IENG410/MANE400), in addition to report for Questions & Tasks, requires a second Report for "IE/MANE PROBLEM". Identification, definition, formulation (including assumptions), development of solution alternatives, evaluation of alternatives, proposing a satisfactory solution, and conclusion (discussion and analysis of the suggested solution) to the IE/MANE PROBLEM observed. Students failing from this second Report fails from the whole training and must repeat it.

(+) If the company does not share some of their data (due to confidentiality), no problem! Just mention this fact in the relevant section of your report, estimate the missing data yourself, and continue to your calculations. We are more interested in "how you use the data" instead of the data itself.

If the report is found to be **Satisfactory (S)**, the student passes. Otherwise, if the report is determined to be **Unsatisfactory (U)**, the student will have to repeat the industrial training at a different company (company must be approved by the Department). In cases when the report is identified as **Incomplete (I)**, it will be returned to the student for correction only for once. Therefore students must correct all the specified parts by the report evaluator and submit the corrected version only once. There will not be any second cycle for corrections.

Cheating

Just like every report submitted by the students, Industrial Training reports are also checked online against plagiarism (by the plagiarism detector software, namely *Turnitin*). A student using some material from

- other reports, including Industrial Training reports
- company website
- company catalog
- internet

in their report, should properly provide references for the work of other people. Otherwise it will be considered as "cheating". In such occasions the students will automatically receive a "U" grade, and will be reported to EMU Student Disciplinary Committee.

To get more detailed information about Industrial Training, please visit the Industrial Training pages of the Department website: https://ie.emu.edu.tr/en/department/industrial-training

ACADEMIC REGULATIONS

Academic Regulations have been laid down by the Northern Cyprus Educational Trust to govern and guide the functioning of Eastern Mediterranean University. The rules and regulations are available at https://mevzuat.emu.edu.tr/. Although some regulations are presented here, students should refer to the given website for the whole regulations.

Registering for Courses

Students must adhere to the exact registration renewal dates and deadlines as specified in the EMU's Academic Calendar which can be found at https://www.emu.edu.tr/en/academics/calendar/1336. Each student in the Department is assigned an *Academic Advisor* who will assist the student with matters related to registration, course selection, career plans and so forth. The list of advisors is posted in notice board next to secretary office in the department. Although the advisor plays a key role in the student's progress through University studies, it is ultimately the student's responsibility to meet all University requirements.

Adding or Dropping Courses

From the first day of the commencement of the classes until the deadline specified on the EMU's Academic Calendar, students are allowed to change their course schedule by Adding a new course or Dropping a registered course.

Withdrawal from courses

In a semester, a student is allowed to Withdraw from at most two registered courses, provided that the student does not get into Part-Time status. Course Withdrawal should be done latest on the set date specified on the Academic Calendar. A student who Withdraws from a course will receive the grade 'W'. This grade is not taken into consideration during the calculation of the CGPA and the GPA, but appears on the transcript. Withdrawal operation must be initiated by the student using the Student Portal. Consequently, the academic advisor of the student receives a notification and confirms or rejects the requested change. A student cannot withdraw from a course that was Withdrawn before, a course that is repeated (a different course with the same Reference Code) or a course that has no credit. Students in "Part-Time" status cannot withdraw from a course.

Academic Term (AT)

"Academic Term" of a student refers to Total Number of Registered Courses in relation to the number of courses in the Department's curriculum. Non-credit courses and courses that are not included in the normal course load upon Senate's decision are not taken into account in determining a student's Academic Term (AT).

Course Load

For every semester, the number of specified credit courses of a registered program makes up the semester course load. Non-credit courses are not taken into account in the computation of the course load. However, upon the recommendation of the student advisor and the approval of the Department Chair: A maximum of two courses can be reduced from the Normal Course Load of a semester. In this case, the student must register for the untaken courses at the first semester the courses become available.

- A student's semester Course Load can be increased by one course at most. In order to do this,
  a) The student's Cumulative Grade Point Average (CGPA) should not be below 3.00, or
  b) The student has to be designated a "High Honor" or an "Honor" at the end of the previous academic term. (Note: GPA $\geq$ 3.00 obtained in the Summer School or obtained with number of registered courses below the specified Normal Course Load for that particular Academic Term does not lead to "High Honor" or "Honor" status).
- Course load of Graduating Students with no academic warnings (CGPA $\geq$ 2.00) can be increased by two courses. A student at the graduation semester is the student who is given the right to graduate upon the successful completion of all projected courses at the end of the last

semester of an academic program and who has at most two remaining courses. Non- credit courses and courses that are not included in the normal course load upon Senate's decision are not taken into account in determining course load.)

Scholastic Status

(1) Performance of a student is based on a Grade Point Average (GPA) and Cumulative Grade Point Average (CGPA) calculations at the end of each semester. Credit received from a course is found by multiplying the credit hours by the coefficient corresponding to the grade received. The GPA is then found by dividing the sum of the credits received from all courses registered during the semester by the total credit hours of the same courses. Cumulative Grade Point Average (CGPA) is computed by dividing the total credits received from all courses the student has completed since joining the program by the sum of the credit hours of these courses. In cases when a course is repeated, the last grade is included in the GPA and CGPA computations.

(2) A student is considered successful at the end of a semester, if the Grade Point Average (GPA) and Cumulative Grade Point Average (CGPA) are at least 2.00 out of 4.00.

(3) Students registered to the Normal Course Load and scores a GPA between 3.00 and 3.49 is designated an "Honor", if the GPA is between 3.50 and 4.00 is designated a "High Honor". GPA obtained in the Summer School will not grant "Honor" or "High Honor" status.

(4) "Actual Term" refers to the Spring and Fall Semesters (except for the English Preparatory School semesters) a student takes courses within the department's curriculum.

(5) Students enrolled in an undergraduate program whose CGPA's are specified below are considered as "Successful", "On Probation" or "Unsuccessful".

End of **A**ctual **T**erm (**EAT**)	Student **Successful**	Student **On Probation**	Student **Unsuccessful**
1st EAT	-	-	-
2nd EAT	CGPA ≥ 1.50	1.00 ≤ CGPA < 1.50	CGPA < 1.00
3rd EAT	CGPA ≥ 1.50	1.00 ≤ CGPA < 1.50	CGPA < 1.00
4th EAT	CGPA ≥ 1.50	1.00 ≤ CGPA < 1.50	***
5th EAT	CGPA ≥ 1.80	1.50 ≤ CGPA < 1.80	CGPA < 1.50
6th EAT	CGPA ≥ 1.80	1.50 ≤ CGPA < 1.80	CGPA < 1.50
7th EAT	CGPA ≥ 1.80	1.50 ≤ CGPA < 1.80	CGPA < 1.50
8th and more	CGPA ≥ 2.00	1.80 ≤ CGPA < 2.00	CGPA < 1.80

******* Students who completed a minimum of 4 academic semesters (if the fourth semester is Spring Semester, then at the end of the Summer School) and who have a CGPA below 1.00 are dismissed from the program. These students are only allowed to transfer to the school programs, if requested.

(6) The starting semester of students transferring from one program to another internally or externally is accepted as an Academic Term. However, transfer students are considered as successful at the new program at the end of the first semester of the transferred program.

(7) Based on the Student Exchange Program framework, every semester spent out of the University is considered as an Academic Term.

(8) Unless there is a valid reason specified in By-Laws and Regulations, students are required to finish four-year programs at most in 8 years and five-year programs at most in 10 years. Periods of leave of absence are not taken into consideration in the specified periods above. Students who fail to graduate within the specified period are dismissed from the University. However, graduating students who meet specific requirements may be given an additional time period. Requirements, additional time period and rules concerning graduating students are regulated by the 'Course Registration By-Law'.

Course Registration of students "On Probation" or "Unsatisfactory" status

- Registration of students "On Probation" status
  Students who are On Probation are obliged to repeat failed courses before registering for the new courses. Such students are allowed to register for two new courses at most, on the condition that they do not exceed Normal Course Load. On Probation students who wish to register in Summer School or who have the Part-Time status are allowed to register only for one new course. Previously registered courses with (W) grades are considered as new courses.

- Registration of students with "Unsatisfactory" status
  Such students will not be allowed to register for a new course. During registration, these students must first register in the courses from which they received the grades: F, NG or D-. However, in the event of the courses from which (F), (NG) or (D-) grades were obtained not being offered, or the student's course load being under the specified limit, the student can repeat courses from which a (D), (D+) or (C-) grade was obtained until the Normal Course Load is met. Courses with (W) grades are considered as new and cannot be registered.

Course Selection

Priorities in course selection are as follows:

1) Courses with (F), (NG), (U) or (D-) grades.
2) Courses with (W) grades
3) Compulsory courses of previous semesters that have not been taken yet.
4) Compulsory courses of the current semester that have not been registered yet.
5) With the approval of the academic advisor, students:
   a) may transfer elective courses belonging to the current semester and not taken before to the following semesters
   b) may take courses from the following semesters. Requests for taking courses from a higher class are finalized after the evaluation of the relevant Dean or Department chair.

Pre-requisite courses

1) In order to register for a course that has a pre-requisite, a student must have obtained at least a D- grade from the related pre-requisite course.
2) Graduating students are allowed to register for courses with pre-requisites even if they score an (F) grade from the pre-requisite course.
3) At all semesters (including the graduation semester), a pre-requisite course and the course following it cannot be taken within the same semester if the pre-requisite course has never been taken before or if the student obtained an (NG) or a (W) grade from it.
4) In special circumstances, Faculty or School Councils have the authority to take decisions concerning the requirements for pre-requisite courses.

Co-Requisite courses

A Co-requisite course is a course which a student must take before or at least together s/he takes that specific course.

Course Repetition

The following provisions are applied in repeating a course:

1) A student who obtains a (D-), (F), (NG) or (U) grade from a course must register for the course at the next available opportunity.
2) If the course to be repeated is an elective or has been excluded from the program, the student is required to take another appropriate course specified by the Department.
3) If a student wishes to improve his/her previously obtained grades, s/he can repeat a course in which s/he previously passed. The grade obtained from the repeated course takes the place of the previous grade. However, the first grade still appears on the transcript.

Taking courses outside the program

1) Students can take extra courses from other programs, from the elective courses of their current program or from postgraduate programs with the understanding that the extra courses taken will not affect their GPA or CGPA grades. Based on this, in a semester,
   a) students whose CGPAs are between 2.00 and 2.49 are allowed to take one (1) extra course on top the maximum course load of the relevant academic semester of the followed program,
   b) students whose CGPAs are 2.50 and above are allowed to take one (2) extra courses on top the maximum course load of the relevant academic semester of the followed program.
2) Apart from the tuition fees of the currently followed program, for each extra course exceeding the maximum courses load of the relevant academic semester of the followed program, students pay the specified fees per credit for the relevant academic year.
3) Students who gain the right to increase their Normal Course Load by one course, can take courses from other programs. In this case, no fees are paid for extra courses.
4) Grades obtained from extra courses are not included in the GPA and CGPA of the registered program. Such courses are given the (NI) status. (NI) status and the letter grade obtained from the extra course are shown on the student transcript. Extra courses are not included in the calculation of the course load of the registered program.
5) Courses with (NI) status do not have to be repeated.
6) Status of the (NI) courses cannot be changed within the same program.

Taking Courses from Another Institution of Higher Education

Students may take courses from other higher educational institutions either during summer school or through student exchange programs. This By-law regulates the conditions for taking courses as a visiting student, exchange program student or special student during the summer school or through student exchange programs from other institutions of higher education that are approved by the University Executive Board or which the University has signed collaboration protocols with.
Conditions for Taking Courses from Another Higher Educational Institution.

1) Department and/or Faculty Board determines whether the student can take courses outside the university or not and/or whether the courses to be taken outside the University are the equivalents of courses in the student's own program in terms of content and credits.
2) Duration of studies at another institution is included in the period of study specified in the Eastern Mediterranean University Education, Examinations and Success By-law, regardless of the difference of the institution and the number of courses to be taken.
3) Total credits of courses taken from another higher education institution cannot exceed 25% of the course credits the student has to take during the undergraduate specified program period.
4) The student keeps his/her student rights in EMU, however, s/he cannot benefit from the student rights regarding diploma or student status in the higher education institution s/he takes course from.
5) A student wishing to take courses from another higher education institution should apply to his/her Department chair in writing and attach a formal and certified document summarizing the titles, credits and content of the courses to be taken as well as the weekly course timetable no later than the relevant semester or Summer School registration renewal period.
6) Equivalency of the grades obtained at another higher education institution is determined by the Faculty Board decisions based on the Senate decisions and relevant by-laws.
7) Students who take courses at another higher education institution continue to pay full tuition fee or the course(s) fees in EMU. However, if the student needs to pay for the courses to be taken at another institution of higher education, fees to be paid in EMU are determined by the University Executive Board.
8) In order to be eligible to take courses from another higher education institution, a student should attend the registered program in EMU for at least one academic year and should have a minimum CGPA of 2.00.
9) Those who do not meet the requirements of article (8) can take courses from another institution of higher education with the approval of the University Executive Board and positive views of the Department and Faculty Boards.

Exchange Programs

https://io.emu.edu.tr/en - EMU International Office website
https://studentexchange.emu.edu.tr/en - EMU Student Exchange Program website

The student exchange program is open to all undergraduate students at the EMU who meet the following criteria: https://studentexchange.emu.edu.tr/en/outgoing/eligibility However the individual universities we partner with may have their own criteria's for accepting applications. Please see their individual student exchange web pages for more information.

Interested students who wish to apply to the student exchange program must complete the online application form https://studentexchange.emu.edu.tr/en/outgoing/exchange-program-eligibility-form. Following a screening process, successful students will be contacted further to complete the application process.

We begin to take applications to at the beginning of each semester. EMU announces the last application dates on student exchange website and social media platforms, however each university that we collaborate with have their individual last application dates. Please look at their student exchange websites for more information.

Summer School

1) Purpose of the Summer School is to give the opportunity to Irregular Students (those students having failed certain courses before) to become Regular. Successful students wishing to complete their program in less than the normal period of study can also enjoy the Summer School.
2) The duration of Summer School is at most 8 weeks. The dates of beginning and end of the Summer School and course registration deadlines are given in the EMU Academic Calendar.
3) Engineering students can take at most 2 courses during the Summer School (Engineering Faculty Council decision).
4) In order to open a course in the Summer Term, the minimum number of students determined by the Rector's Office should complete their registration.
5) Students who have fulfilled all requirements of the English Preparatory School, may register in Summer School courses.
6) Students may apply to Withdraw from a Summer School course, via their Student Portal, within the deadline specified in Academic Calendar. Students are given a 'W' grade for the Withdrawn courses.
7) The fee to be paid for each registered course is announced by the Rectors' Office.

Examinations, Success and Evaluations in the Summer School

1) Courses taken during the Summer School are listed under the heading "Summer School" in the transcript.
2) Achievements during the Summer School are taken into account in the computation of the CGPA. However, Summer Term is not considered as an actual term.
3) After Summer School, during the following semesters, provisions of Articles 20 or 21 of Regulation for Education, Examinations and Success are applied to students who fail to obtain a CGPA defined by the same articles at the end of the Summer School.
4) Summer School cannot be considered as part of the "last two semesters" for the purpose of Graduation Make-up examinations. Graduation Make-up examinations for at most 2 courses taken during the Summer School and/or preceding two consecutive semesters can be given to students only if upon their successful completion, the student will have satisfied all requirements for graduation.

Taking Courses from Other Higher Educational Institutions during the Summer Term

1) During the Summer Term, students can take courses from other institutions of higher education subject to the provisions of the "EMU Taking Courses from Another Institution By-law".
2) "F" and "E" grades are issued for courses taken from other Higher Educational Institutions. In order for a student to achieve an "E" grade, s/he should obtain at least 60 or a "C" grade (or another equivalent; e.g., CC etc.). Any other grades obtained are given an "F" grade.

Leave of Absence (Semester Leave)

1) Students may request a Leave of Absence (Semester Leave). Decision on these applications is given by the Rector, upon the proposal of the Dean who has considered the advice of the Department Chair.
2) Students can apply for Leave of Absence with a valid reason within the first 5 weeks of the semester starting from the first day of the commencement of classes.
3) A student can be granted at most 4 (four) semesters of Leave of Absence for the duration of study. Under compelling circumstances this period can be extended with the decision of the University Executive Board.

EXAMINATIONS and ASSESSMENTS

Course Grades and Grade Points

(1) Performance of a student for each course is evaluated by the Course Instructor as a Letter Grade given below.

Letter Grade	Grade Point	Description
A	4.00	Superior Pass
A-	3.70	Very Good Pass
B+	3.30	Good Pass
B	3.00	Good Pass
B-	2.70	Pass
C+	2.30	Pass
C	2.00	Pass
C-	1.70	Conditional Pass
D+	1.30	Conditional Pass
D	1.00	Conditional Pass
D-	0.70	Failure
F	0.00	Failure
NG	0.00	Nil Grade - Failure
I	-	Incomplete
W	-	Withdrawal
S	-	Satisfactory
U	-	Unsatisfactory

A student who receives A, A-, B+, B, B-, C+, C, C-, D+, D or S from a course is considered to have succeeded in that course.

(2) A student who receives D-, F, NG or U from a course is required to take that course again in the next semester that it is offered.

(3) **"I" Incomplete**:

"I" grade is given to students who have not sat the end of semester exam and/or has not completed some of the projects/laboratory work which contributes to the end-of-semester grade because of a valid reason that can officially be proved if required. Such students are obliged to sit for the missed exam and/or complete the project/laboratory work at least one week before the registration period of the following semester. Failure to comply with this will result in an automatic F grade being given for the concerned course. However, students whose reason for absenteeism continues at the end of the above indicated deadline, must apply to the Department with official certification indicating the continuation of the reason for absenteeism. The Department Chair will then take the issue to the Faculty Council where a decision will be taken on the period for the completion of the "I" grade. The period of completion requirement mentioned above is not valid for graduating

students. Faculty Councils determine these students' situations. An "I" grade is not taken into account in the computation of the Grade Point Average (GPA) or Cumulative Grade Point Average (CGPA). A student who thinks is eligible for "I" grade, must apply to the Course Instructor together with official documentation supporting the case, at most 3 working days following the final examination date of the course.

(4) **"W" Withdrawal from a Course**

The grade "W" is given to students who were allowed to Withdraw from a registered course during the period specified on the Academic Calendar. The "W" grade is shown on the transcript of the student.

(5) **"S" / "U" Satisfactory / Unsatisfactory**

The grades "S" or "U" are given to students who are registered to certain courses or Industrial Trainings. "S" indicates Satisfactory and "U" indicates Unsatisfactory completion of the course.

(6) **"NG" Nil Grade**/ Failing from Absenteeism:

Students who do not comply with the required level of attendance and/or not fulfilling the requirements for the evaluation of the course are given the "NG" grade by the course instructor. "NG" grade is included in the computation of GPA and CGPA.

Attendance Requirements

The University believes that the benefits of academic studies come not only from independent study and the preparation of materials for formal grading, but also from participation in classes, tutorials and laboratory activities. Regular attendance of students is therefore required in all courses. University regulations do not permit unexcused absence or tardiness.

For flagrant violation of the spirit of regular class attendance, an EMU faculty member may report an "NG" grade whenever unexcused absences are excessive. Such action may be taken when the number of unexcused absences exceeds 20% of the total class/laboratory hours scheduled for the course. You should be aware that your course grades can be adversely affected through absence, whether excused or unexcused.

Examinations

- In every academic semester, a minimum of one and a maximum of three Midterms and a Final examination are given to students in each course. Quizzes are excluded from this limitation.
- At the beginning of each semester, the course instructor prepares a Course Outline indicating the topics to be covered during the semester together with the number of examinations and their weights. Course outline must be posted on the course web-page.
- Quizzes can be administered without prior notice.

Make-up Examinations

- A student who fails to sit for an examination with a valid and documented reason is given a Make-up exam. Within three days after the examination, students who wish to take a Make-up must submit a written statement to the course instructor explaining the reason(s) for the request.
- Make-up examinations for the Midterm exams are administered by the course instructor during the semester.
- Make-up examinations must be completed before the beginning of Resit Exam Application period.
- If the cause of the student's absence persists during the time allocated for the Make-up examination, a new make-up is given. However, if the Make-up examination is not taken by the student ten days before the registration for the new term begins, the situation is brought to the attention of the Faculty Council and decided on accordingly.

Graduation Make-up Examinations

Any student who is at the graduation semester but fails to fulfill all requirements is eligible to take the Graduation Make-up examination **(*only if upon their successful completion, the student will have satisfied all requirements for graduation*)** under the following circumstances:

(1) Students who fail to meet the graduation requirements due to F and/or D- grades are allowed to sit the Graduation Make-up exam for up to 2 courses with previously obtained grades of F and/or D-

provided that these courses were taken within the last two semesters [(**)].
(2) Students who fail to meet the graduation criteria due to low CGPA (less than 2.00) are allowed to take the graduation make-up examination for up to 2 courses with D, D+, C- grades.
(3) A student who fails a Graduation Make-up of a specific course must register for that course again. A Graduation Make-up cannot be given for courses with NG grades. Grades obtained from the graduation make-ups are evaluated as term letter grades.

[(**)] Summer School cannot be considered as part of the "last two semesters" for the purpose of Graduation Make-up Examinations. Graduation Make-up examinations for at most 2 courses taken during the Summer School and/or preceding two consecutive semesters can be given to students only if upon their successful completion, the student will have satisfied all requirements for graduation.

Graduating students who failed two courses at most and who have the appropriate number of remaining courses during the Summer Term, in the case of these courses being opened during Summer School, are given the right of Graduation Make-up instead of registering for the failed courses.

Resit Exams

- Resit Examination is an additional exam right granted to those undergraduate students who were given right to attend the Final exam of a specific course.
- Resit Exams are administered at the end of each term (excluding the Summer term) following the announcement of the letter grades.
- Taking a Resit Exam requires Online Registration via Student's Portal (no fees are applied).
- Students may cancel their registration in 3 days after the end of Resit Application day. (Online)
- No Resit Examinations are available for Project/Application/Practice courses.
- No Resit Examinations are available for the courses of the English Preparatory School.
- No Resit Examinations are applied for graduate courses (even if registered by a student studying at an undergraduate program).
- Resit Exam covers all topics of that course (all topics included in Midterm and Final exams)
- Weight of the Resit Exam will be equal to the total weight of Midterm and Final exams of a specific course.
- The Letter Grade of the course will be assigned according to the **Resit score** (if there are any other scores obtained from other forms of assessment than Midterm and Final exams, they will also be considered in the Letter Grade calculation)
- There is NO Make-up exam for the Resit Exam.
- Students may register for the Resit Exam of the courses with "D-" or "F" grades obtained within that term.
- Students with a "UNSATISFACTORY" or "ON PROBATION" status may register for the Resit Exams of all (possible) courses, excluding those with "NG" grades, at the end of the relevant term.
- In the event of not sitting for a registered Resit Exam, students will be assigned "0" Resit score.
- Letter Grade obtained in the Resit Exam is listed under the heading "Resit Exam" in the transcript.

Appeals to Exam Results

A student is given a chance to see all documents involved in the determination of the semester grade no later than a week following the publication of the course grades. Any appeal against the marks of a midterm examination or any other assessment components must be made to the course instructor within one week following the announcement of the marks. Course instructor is required to evaluate the appeal within one week. If the student is not satisfied with the instructor's evaluation, s/he has the right to appeal to the Department Chair which should be made in writing within 3 days following the instructor's evaluation date. The Department Chair will form a committee of instructors to finalize the student's appeal within one week. The decision of the committee is final. Any appeal concerning a semester grade must be made to the relevant course instructor no later than the end of the registration period of the following semester.

GPA and CGPA Calculations

Credit Earned

A student earns a credit based on the level of his/her achievement in a course. The *credit earned* is the product obtained by multiplication of the "Credit-Hour" and the "Grade-Point" obtained from a course.

Grade-Point Average (GPA) and Cumulative Grade-Point Average (CGPA)

A student's academic achievement for each term is expressed numerically by an index referred to as the *Grade Point Average* (GPA). The GPA is obtained by:

- Calculating *credit earned* for each course;
- Adding these results for all courses in the term to obtain the total credits;
- Dividing the total credits by the total credit-hours attempted.

The GPA so obtained can range from 0.00 to a maximum of 4.00.

A student's overall academic achievement is expressed numerically by an index referred to as the *Cumulative Grade-Point Average* (CGPA). The CGPA is obtained by:

- Adding *credits earned* in each term completed;
- Adding Credit-Hours attempted in each term completed;
- Dividing the Total Credits Earned by the Total Credit-Hours attempted.

Example:

Assume that a Freshman student gets the following grades during the first semester:

Ref. Code	Course Code	Credit-Hour	Course Grade	Grade-Point	Credits Earned
26711	CHEM101	4	D-	0.7	2.8
26712	PHYS101	4	B	3.0	12.0
26713	MATH151	4	F	0.0	0.0
26714	ENGL191	3	A-	3.7	11.1
26715	CMPE110	+ 4	C+	2.3	+ 9.2
		19			35.1

Therefore, GPA = 35.1 / 19 = 1.85 (GPA < 2.00). As this is the first semester of the student, GPA and CGPA are the same: CGPA = GPA = 1.85.

Now, in the second semester, the student repeats CHEM101 (was "D-") and MATH151 (was "F") and registers to 3 other courses (PHYS102, ENGL192, MATH163). Assume that the student gets the following grades at the end of the second semester:

Ref. Code	Course Code	Credit-Hour	Course Grade	Grade-Point	Credits Earned
26711	CHEM101	4	C+	2.3	9.2
26713	MATH151	4	A	4.0	16.0
26722	PHYS102	4	B+	3.3	13.2
26724	ENGL192	3	A-	3.7	11.1
26729	MATH163	+ 3	C-	1.7	+ 5.1
		18			54.6

Therefore for the second semester GPA = 54.6 / 18 = 3.03 (student will be in "Honor" status).

The student's CGPA at the end of the second semester will be:

CGPA = "Total Credits Earned" / "Total Credit-Hours Attempted" = 86.9 / 29 = 3.00 (*)

Where the "Total Credits Earned" and "Total Credit-Hours Attempted" are calculated as:

Total Credits Earned = (Total Credits Earned in the First and Second Semesters)
– (Previous Total Credits Earned from the Repeated Courses)
= (35.1 + 54.6) – (2.8 + 0.0)
= 86.9

Total Credit-Hours Attempted = (Total Credit-Hours Attempted in the First and Second Semesters) – (Total Credit-Hours of Repeated Courses in the Last Semester)
= (19 + 18) – (4+4)
= 29

(*) Note that 86.9 / 29 equals 2.99655, and this value is rounded up as 3.00. However for Graduation requirements, the CGPA of a graduating student must be at least 2.00 without any rounding.

Note: CGPA Calculator for both undergraduate programs are available at the Department web site.

MINOR PROGRAMS

Department of Industrial Engineering students can register to Minor Programs "Minor in Mathematics" or "Minor in Molecular Biology & Genetics". Please refer to the following link for further details: https://ie.emu.edu.tr/en/programs/undergraduate-programs/minor-programs

Rules for registering Minor Programs:
In order to be qualified to apply for a minor program, the student's CGPA must be at least 2.50. The student can apply for a minor program at the beginning of the 3rd semester of the main-branch undergraduate program.
Further rules are available at: http://mevzuat.emu.edu.tr/5-1-8-Rules-Minorbylaw.htm

DOUBLE MAJOR PROGRAMS

Department of Industrial Engineering offers the following two Double Major programs to the undergraduate students of Industrial Engineering program: Double Major with Mechanical Engineering or Double Major with Business Administration.

Rules for registering Double Major Programs:

- Students can apply for the Double Major program earliest at the beginning of the third semester of the first major program.
- Student should obtain minimum grade of 'D' for all credit courses taken in the first major program up to the period of application.
- Student should hold a minimum CGPA of 3.00.

Further rules are available at: http://mevzuat.emu.edu.tr/5-1-7-Rules-Doublemajorprgs.htm

STUDENT CLUB (DAUEMK)

There are numerous student clubs and societies at Eastern Mediterranean University for a wide range of activities including tennis, basketball, volleyball, football, handball, cricket, climbing, chess, ceramics, journalism, art, science and culture, literature, folklore, drama and animation, music, cinema, and photography. One of these clubs is the Industrial Engineering Club, which was founded in 1998. The club mainly aims to make researches about Industrial Engineering and to present the results of these researches to both students and teaching staff. Club also aims to increase the technical knowledge of students by organizing meetings and seminars, and to increase the communication within the department by organizing social, cultural, and sports activities. The student club is a member of ESTIEM, EMT, and IISE Student Chapter. The club can be reached from following links:
Estiem Local Group Famagusta | Facebook ; **https://www.instagram.com/emuieclub/**

Industrial Engineering

The Industrial Engineering Department is offering both undergraduate and graduate programs in Industrial Engineering. The Bachelor of Science program in Industrial Engineering aims at providing an interdisciplinary educational foundation for its graduates to understand, find and implement solutions with a systems engineering perspective. To achieve this objective students are provided with the essential tools which enable them to deal with the technological, business and human aspects of problems in complex systems. Graduates of the program are prepared for employment in technologically and socially developed organizations, take leadership roles, or for pursuing research work at graduate level.

The undergraduate program requires a total of 145 credit hours: 12 credit hours from university core, 20 credit hours from faculty core, 92 credit hours from area core, 12 credit hours from area electives, and 9 credit hours from university electives. Regular course load for students in Industrial Engineering program during fall or spring semesters is 5 or 6 credited courses (between 17-19 credit hours) whereas in summer semester the students can take at most 2 courses.

The first year of the Industrial Engineering program is dedicated to foundation courses in mathematics and basic sciences (freshman calculus, physics, and chemistry), and some University core courses. The program includes three courses from Mechanical Engineering (engineering graphics, mechanics, and thermodynamics), one course from Computer Engineering (computing and programming), one course from Electrical and Electronic Engineering (fundamental concepts) and three courses from Faculty of Business and Economics (management, economics, and cost accounting). Apart from calculus courses there are two concentrated mathematics courses on Linear Algebra & Differential Equations, and Probability Theory & Statistics. Students are required to take two English courses and one course on communication skills (written and oral presentation). Additionally, the program offers flexibility for students to build up their background with elective courses according to their own career goals. The Industrial Engineering program undergraduate curriculum culminates in a two-semester capstone senior design course sequence that should have a significant design component with formal reports. At the end of each semester, a presentation is given before faculty, students, guests, and if possible sponsors. Teams of students device solutions to Industrial Engineering problems submitted by faculty, or if possible industry and the community at large. In sum the undergraduate program requirements for the Bachelor of Science in Industrial Engineering are 33 credit hours of courses in Mathematics and Basic Sciences, 83 credit hours in Engineering Topics and Design (including core courses and area elective courses), and 29 credit hours in General Education courses in Social Sciences, Arts and Humanities, and others.

Courses offered by the program are mainly focused on the following core topics: Operations Research, Work Study and Ergonomics, Engineering Economy, Production Planning, Simulation, Information Systems, Facilities Planning and Design, Quality Engineering. Case studies, laboratory work, intensive computer usage and technical report writing are among the requirements of most coursework. Students have to complete three separate industrial trainings in industrial production plants.

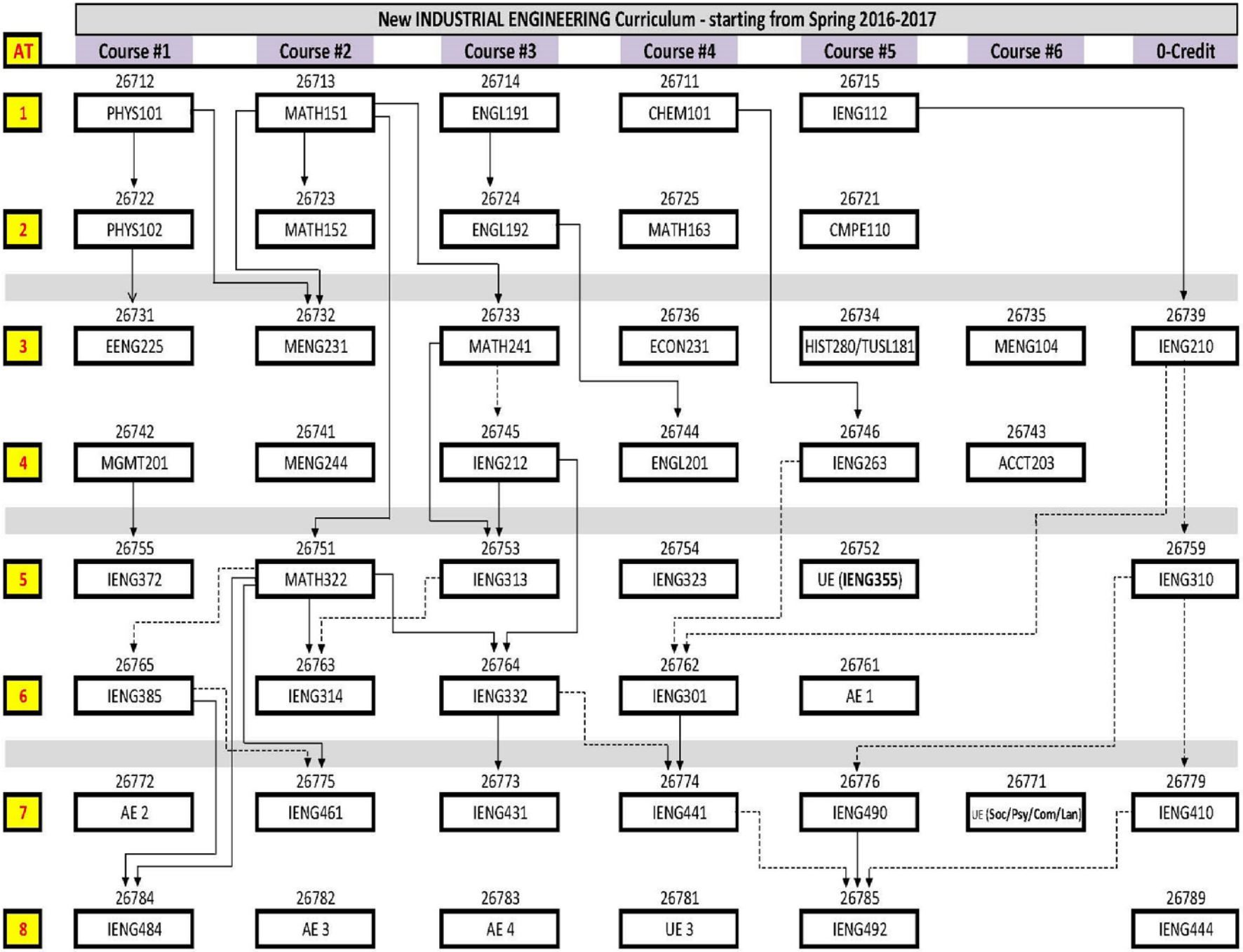
Industrial Engineering program offers two Double Major program opportunities for its successful students. One of the opportunities is to go through Double Major Program in Industrial Engineering and Mechanical Engineering, and the other opportunity is to go through Double Major Program in Industrial Engineering and Business Administration. There are several successful students enrolled in the programs and the Higher Education Board in Turkey (YÖK) has also approved equivalency certificates for the graduates of the Double Degree programs.

HIST280 and TUSL181 courses

All international students who are not native speakers of Turkish must take TUSL181, and all students who are citizens of Republic of Turkey and the Turkish Republic of Northern Cyprus must take HIST280.

Ref. Code	Course Code	Course Title	Credit	Pre-requisite (P) & Co-requisite (C)
		FRESHMAN YEAR		
Fall Semester				
26711	CHEM101	General Chemistry	4	
26712	PHYS101	Physics – I	4	
26713	MATH151	Calculus – I	4	
26714	ENGL191	Communication in English – I	3	
26715	IENG112	Introduction to IE	4	
Spring Semester				
26721	CMPE110	Fund. of Computing & Programming	4	
26722	PHYS102	Physics – II	4	PHYS101 (C)
26723	MATH152	Calculus – II	4	MATH151 (P)
26724	ENGL192	Communication in English - II	3	ENGL191 (C)
26725	MATH163	Discrete Mathematics	3	
		SOPHOMORE YEAR		
Fall Semester				
26731	EENG225	Fundamentals of Electrical Engineering	3	
26732	MENG231	Engineering Mechanics	3	MATH151 (P), PHYS101 (P)
26733	MATH241	Linear Algebra & Ordinary Diff. Eq.s	4	MATH151 (P)
26734	HIST280 or TUSL181	History of Turkish Reforms or Communication in Turkish	2	
26735	MENG104	Engineering Graphics	3	
26736	ECON231	Fundamentals of Economics	3	
26739	IENG210	Industrial Training - I	0	IENG112 (P)
Spring Semester				
26741	MENG244	Fundamentals of Thermodynamics	3	
26742	MGMT201	Principles of Management	3	
26743	ACCT203	Cost Acct. for Managerial Decision Making	3	
26744	ENGL201	Communication Skills	3	ENGL192 (P)
26745	IENG212	Modeling and Optimization	3	MATH241 (C)
26746	IENG263	Materials and Manufacturing Processes	4	CHEM101 (P)
		JUNIOR YEAR		
Fall Semester				
26751	MATH322	Probability and Statistical Methods	3	MATH151 (P)
26752	UE-01	Univ. Elective (IENG355-Ethics in Eng.)	3	
26753	IENG313	Operations Research - I	4	MATH241 (P), IENG212 (P)
26754	IENG323	Engineering Economy	4	
26755	IENG372	Information Systems and Technology	4	MGMT201 (P)
26759	IENG310	Industrial Training – II	0	Completion of IENG210 & freshman courses
Spring Semester				
26761	AE-01	Area Elective - I	3	
26762	IENG301	Fundamentals of Work Study and Ergonomics	4	IENG263 (C), IENG210 (C)
26763	IENG314	Operations Research - II	4	MATH322 (P), IENG313 (C)
26764	IENG332	Production Planning - I	4	IENG212 (P), MATH322 (P)
26765	IENG385	Statistical Applications in Engineering	3	MATH322 (C)
		SENIOR YEAR		
Fall Semester				
26771	UE-02	University Elective	3	
26772	AE-02	Area Elective – II	3	
26773	IENG431	Production Planning - II	4	IENG332 (P)
26774	IENG441	Facilities Planning and Design	4	IENG301 (P), IENG332 (C)
26775	IENG461	Systems Modeling and Simulation	4	MATH322 (P), IENG385 (C)
26776	IENG490	Intro. to Manuf. and Service Systems Design	1	IENG310 (C), one semester before IENG492
26779	IENG410	Industrial Training - III	0	IENG310 (C)
Spring Semester				
26781	UE-03	University Elective	3	
26782	AE-03	Area Elective - III	3	
26783	AE-04	Area Elective - IV	3	
26781	IENG484	Quality Engineering	4	IENG385 (P), MATH322 (P)
26782	IENG492	Manuf. and Service Systems Design Project	4	IENG490(P), IENG410(C), IENG441(C)
26789	IENG444	Seminars on Manuf. and Service Systems	0	in the Last Spring semester before graduation

TOTAL CREDIT HOURS = 145


New INDUSTRIAL ENGINEERING Curriculum - starting from Spring 2016-2017
AT
Course #1
Course #2
Course #3
Course #4
Course #5
Course #6
0-Credit
1
26712 PHYS101
26713 MATH151
26714 ENGL191
26711 CHEM101
26715 IENG112
2
26722 PHYS102
26723 MATH152
26724 ENGL192
26725 MATH163
26721 CMPE110
3
26731 EENG225
26732 MENG231
26733 MATH241
26736 ECON231
26734 HIST280/TUSL181
26735 MENG104
26739 IENG210
4
26742 MGMT201
26741 MENG244
26745 IENG212
26744 ENGL201
26746 IENG263
26743 ACCT203
5
26755 IENG372
26751 MATH322
26753 IENG313
26754 IENG323
26752 UE (IENG355)
26759 IENG310
6
26765 IENG385
26763 IENG314
26764 IENG332
26762 IENG301
26761 AE 1
7
26772 AE 2
26775 IENG461
26773 IENG431
26774 IENG441
26776 IENG490
26771 UE (Soc/Psy/Com/Lan)
26779 IENG410
8
26784 IENG484
26782 AE 3
26783 AE 4
26781 UE 3
26785 IENG492
26789 IENG444

Curriculum Notes

Electives

A. Area Electives

Area Electives (AE) are courses, which provide a well-defined emphasis area for the students. These courses may help the student prepare for graduate study in a technical master's program or provide tools for better productivity as a practicing engineer in any industry. During the BS program in Industrial Engineering students must take 4 AE courses.

List of Departmental Area Electives:

Course Code	Course Title	Credit
IENG374	Computational Modeling in IE	(3,1) 3
IENG405	Human Factors Engineering	(3,1) 3
IENG409	Occupational Safety and Health Management	(3,0) 3
IENG416	Network Analysis	(3,1) 3
IENG417	Applications in Mathematical Programming and Optimization	(3,1) 3
IENG418	Stochastic Processes	(3,1) 3
IENG419	Project Management	(3,1) 3
IENG426	Multi-attribute Decision Making	(3,1) 3
IENG435	Advanced Topics in Inventory Planning and Control	(3,1) 3
IENG436	Machine Scheduling	(3,1) 3
IENG438	Fundamentals of Supply Chain Management	(3,1) 3
IENG446	Advanced Manufacturing Technologies	(3,1) 3
IENG447	Computer Integrated Manufacturing	(3,1) 3
IENG448	Service Systems	(3,1) 3
IENG452	Introduction to Entrepreneurship	(3,0) 3
IENG455	Engineering Management	(3,0) 3
IENG456	Technology Management	(3,0) 3
IENG457	R&D Management and Technology Transfer	(3,0) 3
IENG458	Legal Environment	(3,0) 3
IENG462	Fundamentals of Systems Engineering	(3,1) 3
IENG465	System Dynamics	(3,1) 3
IENG476	Artificial Intelligence and Expert Systems	(3,1) 3
IENG485	Forecasting and Time Series Analysis	(3,1) 3
IENG486	Recent Topics in Quality Management	(3,1) 3
IENG487	Design and Analysis of Experiments	(3,1) 3
IENG488	Reliability Engineering	(3,1) 3
IENG495	Introduction to Research in Industry	(3,0) 3

In addition to above courses, there are several courses from Computer Engineering, such as CMPE428 (Data Science), CMPE461 (Artificial Intelligence), and one course from Business Administration (MGMT477 – Business Processes and ERP Systems) that can be taken as AE (see p. 27-32). The Department may add other elective courses to the given list, and reserves the right to offer any of the area elective courses in any semester.

B. University Electives

There are 3 University Elective (UE) courses in BS program. First UE course is restricted to IENG355 (Ethics in Engineering). Second UE course must be chosen from a list of courses approved by the Department Council (SOCI100, SOCI212, PSYC100, PSYC250, PSYC435, PRAD102, PRAD206, PRAD233, PRAD303, PRAD402, COMM122, COMM321, COMM322, HIRE102 (in Turkish), HIRE206 (in Turkish), HIRE233 (in Turkish), HIRE303 (in Turkish), HIRE402 (in Turkish), ILET321 (in Turkish), ILET322 (in Turkish), PSKL100 (in Turkish), SOSY121 (in Turkish), or any Language course, like GERM111, RUSS111 etc.. Note that students are allowed to register at most one course in Turkish. The third UE course is completely free to choose.

Course Descriptions

CHEM101 General Chemistry (4 - 0 - 1) 4
Atoms, molecules and ions; Mass relations in chemistry, stoichiometry; Gasses, the ideal gas law, partial pressures, mole fractions, kinetic theory of gases; Electronic structure and the periodic table; Thermo chemistry, calorimetry, enthalpy, the first law of thermodynamics; Liquids and Solids; Solutions; Acids and Bases; Organic Chemistry.

PHYS101 Physics – I (4 - 1 - 0) 4
Physical quantities and units. Vector calculus. Kinematics of motion. Newton`s laws of motion and their applications. Work-energy theorem. Impulse and momentum. Rotational kinematics and dynamics. Static equilibrium.

MATH151 Calculus – I (4 - 0 - 1) 4
Limits and continuity. Derivatives. Rules of differentiation. Higher order derivatives. Chain rule. Related rates. Rolle's and the mean value theorem. Critical Points. Asymptotes. Curve sketching. Integrals. Fundamental Theorem. Techniques of integration. Definite integrals. Application to geometry and science. Indeterminate forms. L'Hospital's Rule. Improper integrals. Infinite series. Geometric series. Power series. Taylor series and binomial series.

ENGL191 Communication in English – I (3 - 0 - 1) 3
ENGL191 is a first semester freshman academic English course. The purpose of this course is to consolidate and develop students' knowledge and awareness of academic discourse, language structures and lexis. The prime focus will be on the further development of writing, reading, speaking and listening skills in academic settings, and on improving study skills in general.

IENG112 Introduction to Industrial Engineering (4 - 1 - 0) 4
This course is designed to introduce the fundamental concepts of Industrial Engineering and give answers to the first questions that are usually asked by the prospective Industrial Engineering students. The course surveys both the traditional and modern topics of Industrial Engineering, providing a historical as well as an academic perspective of the whole profession. Related software applications, together with fundamentals of modeling & optimization, and production system design and control (methods engineering, work measurement, ergonomics, facilities planning and design, production planning, inventory control and quality control) will also be covered in the course.

CMPE110 Fundamentals of Computing and Programming (4 - 1 - 0) 4
Design of computer algorithms with pseudo-code to solve problems, analyze engineering related problems using computer. Basic elements of a high level computer programming language: Data types, constants and variables, arithmetic and logical operators and expressions. Fundamental components of Python programming language: Storing and manipulating user-input data, design and use of selection structures, design and use of repetition structures, lists and other data structures, functions dictionaries and sets, file input/output. Explain the fundamental concepts of object-oriented programming and concept of a class: Define encapsulation, inheritance, and polymorphism.

PHYS102 Physics – II (4 - 1 - 0) 4
Kinetic theory of ideal gases. Equipartition of energy. Heat, heat transfer and heat conduction. Laws of thermodynamics, applications to engine cycles. Coulombs law and electrostatic fields. Gauss's law. Electric potential. Magnetic field. Amperes law. Faradays law.
Pre-requisite: PHYS101

MATH152 Calculus – II (4 - 0 - 1) 4
Vectors in R3. Lines and Planes. Functions of several variables. Limit and continuity. Partial differentiation. Chain rule. Tangent plane. Critical Points. Global and local extrema. Lagrange multipliers. Directional derivative. Gradient, Divergence and Curl. Multiple integrals with applications. Triple integrals with applications. Triple integral in cylindrical and spherical coordinates. Line, surface and volume integrals. Independence of path. Green's Theorem. Conservative vector fields. Divergence Theorem. Stokes' Theorem.
Pre-requisite: MATH151

ENGL192 Communication in English – II (3 - 0 - 0) 3
ENGL192 is a second semester freshman academic English course The purpose of this course is to further consolidate and develop students' knowledge and awareness of academic discourse, language structures and lexis. The prime focus will be on the further development of writing, reading, speaking and listening skills in academic settings, and on improving study skills in general.
Pre-requisite: ENGL191

MATH163 Discrete Mathematics (3 – 0 – 1) 3
Set theory, functions and relations; introduction to set theory, functions and relations, inductive proofs and recursive definitions. Combinatorics; basic counting rules, permutations, combinations, allocation problems, selection problems, the pigeonhole principle, the principle of inclusion and exclusion. Generating functions; ordinary generating functions and their applications. Recurrence relations; homogeneous recurrence relations, inhomogeneous recurrence relations, recurrence relations and generating functions, analysis of algorithms. Propositional calculus and boolean algebra; basic boolean functions, digital logic gates, minterm and maxterm expansions, the basic theorems of boolean algebra, simplifying boolean function with Karnaugh maps. Graphs and trees; adjacency matrices, incidence matrices, eulerian graphs, hamiltonian graphs, colored graphs, planar graphs, spanning trees, minimal spanning trees, Prim's algorithm, shortest path problems, Dijkstra's algorithms.

EENG225 Fundamentals of Electrical Engineering (3 – 0 - 1) 3
Basic electrical quantities. Fundamental circuit laws. Sinusoidal steady state analysis and transformers. Three-phase circuits.Principles of electromechanical energy conversion. DC and AC machines. Electrical safety.
Pre-requisite: PHYS102

MENG231 Engineering Mechanics (3 - 0 - 1) 3
Review of vector algebra. Principle of mechanics. Static equilibrium of particles and rigid bodies. Distributed force systems. Elements of structures, beam, trusses, cables. Friction. Review of particle dynamics, force, energy and momentum methods. Planar kinematics and kinetics of rigid bodies. Energy methods. Particle and rigid body vibrations.
Pre-requisite: MATH151, PHYS101

MATH241 Linear Algebra and Ordinary Differential Equations (4 – 0 - 1) 4
Systems of linear equations: Elementary row operations, echelon form, Gaussian elimination method; Matrices; determinants, adjoint and inverse matrices, Cramer's rule. Vector spaces. Linear independence, bases and dimensions; linear mappings. Eigenvalue problem. First-order differential equations, separable differential equations, change of variables, exact differential equations. Second-order differential equations; the method of undetermined coefficients, the variation of parameters method. Systems of differential equations. Vector formulation. General results of first order linear systems. Differential systems, Homogeneous constant coefficient vector differential equations. Variations of parameters for linear systems. Laplace Transform Method.
Pre-requisite: MATH151

TUSL181 Communication in Turkish (2 - 0 - 0) 2 – For International students only
A basic Turkish course introducing the Turkish language to international students. It incorporates all four language skills and provides an introduction to basic grammar structures. Students will be encouraged to develop their writing skills through a variety of tasks. The aim of this course is for students to be able to understand and communicate in everyday situations, both in the classroom and in a Turkish-speaking environment.

HIST280 History of Turkish Reforms (2 - 0 - 0) 2 – For Turkish students only
This course is for Turkish students only. The aim of the course is to introduce the Ottoman Empire's situation at the 19. Century, Trablus and Balkan Wars, I. World War and it's consequences, Turkish Independence War, Mudanya Treaty, Lausanne Treaty, and Principles of Ataturk.

MENG104 Engineering Graphics (2 - 3 - 0) 3
Principles of engineering graphics with the emphasis on laboratory use of AUTOCAD software. Plane Geometry, geometrical constructions, joining of arcs, principles of orthographic projection, isometric and oblique drawing, principles of sectioning, reading engineering drawing from blueprints, building plans or electrical circuit diagrams.

ECON231 Fundamentals of Economics (3 - 0 - 1) 3
The course will cover fundamental concepts of both macro- and microeconomics at the introductory level. Microeconomics aspects of the course include supply and demand; elasticity; market efficiency; cost of

production; and profit maximization in competitive and monopolistic markets. Macroeconomics aspects include national income accounting; unemployment; inflation; LR and SR aggregate demand and supply curves; economic growth and international trade.

IENG210 Industrial Training – I 0-credit
This is the first Industrial Training course for the students. In partial fulfillment of graduation requirements each student is required to complete three industrial training in accordance with rules and regulations set by the Department. In the training students are required to observe the organization as a whole and write a formal report based on the questions and tasks provided in the Log-Book.
Pre-requisite: IENG112

MENG244 Fundamentals of Thermodynamics (3 – 0 - 1) 3
Conservation of energy. Conservation of mass. Work and heat. First law of thermo-dynamics. Properties and processes of ideal gases. Second law of thermodynamics. Compressors, internal combustion engines. Properties of steam. Heat exchangers. Steam power plants. Nuclear energy. Pumps and fans. Refrigeration.

MGMT201 Principles of Management (3 - 0 - 0) 3
The course intends to provide students with a broad overview of issues facing managers in contemporary organizations. Thus students are expected to apply the theories, techniques, and tools that they will learn here to practical situations. Topics covered include: The planning, organizing, leading and controlling functions that are required for effective management in organizations today; issues in decision making, motivation, diversity, and entrepreneurship.

ACCT203 Cost Accounting for Managerial Decision Making (3 - 0 - 1) 3
Understanding the balance sheet and income statement of a production firm. Calculation of costs of goods and services produced by production and service companies. Measurement and reporting of financial and nonfinancial information relating to cost of acquiring and utilizing resources within the organization. Use of cost accounting data for managerial decision making.

ENGL201 Communication Skills (3 - 0 - 0) 3
This course is a second year mainstream communication skills course for students at the Faculty of Engineering. It aims to introduce a range of skills, including effective written and oral communication, research skills and study skills. Throughout the course the students will be involved in project work intended to help them in their immediate and future academic and professional life. This will include library research, technical report writing and an oral presentation. By investigating a topic of their own choice, students will develop their understanding of independent research skills. During the report writing process, students will improve their writing and develop the ability to produce organized, cohesive work. The oral presentation aims to enhance spoken fluency and accuracy and provide training in the components of a good presentation.
Pre-requisite: ENGL192

IENG212 Modeling and Optimization (3 - 0 - 1) 3
This course is designed to install in students the ability of conceptualization of real life system in the form of mathematical models. Principles of model building and basic optimization concepts and approaches for problem solving will be discussed in detail. The application of these principles and concepts will be illustrated using simplified but practical problems from diverse fields of application in manufacturing and service systems. Scopes and limitations of suggested formulations will be discussed and their applications in real-life situations will be studied with the help of samples of computational experience. The emphasis will be on the building and interpretation of models rather than the solution processes.
Co-requisite: MATH241

IENG263 Materials and Manufacturing Processes (4 - 1 - 0) 4
Materials and properties; structure and manufacturing properties of metals; material selection based on mechanical properties for manufacturing; metal casting; bulk deformation processes (rolling, extrusion, forging); sheet-metal forming; machining processes (turning, drilling and milling); abrasive machining, finishing; welding processes; processing of plastics; tooling safety
Pre-requisite: CHEM101

MATH322 Probability and Statistical Methods (3 - 0 - 1) 3
Introduction to probability and statistics. Operations on sets. Counting problems. Conditional probability and total probability formula, Bayes' theorem. Introduction to random variables, density and distribution functions. Expectation, variance and covariance. Basic distributions. Joint density and distribution function. Descriptive statistics. Estimation of parameters, maximum likelihood estimator. Hypothesis testing.
Pre-requisite: MATH151

IENG355 Ethics in Engineering (3 - 0 - 0) 3 - will be taken as the first University Elective (UE01)
This course is designed to introduce moral rights and responsibilities of engineers in relation to society, employers, colleagues and clients. Analysis of ethical and value conflict in modern engineering practice. Importance of intellectual property rights and conflicting interests. Ethical aspects in engineering design, manufacturing, and operations. Cost-benefit-risk analysis and safety and occupational hazard considerations.

IENG313 Operations Research – I (4 - 1 - 0) 4
This course is designed to introduce the fundamentals of operations research. The emphasis is on solution of deterministic optimization models. The topics covered are application of scientific methodology to business problems, systems concept, team concept in problem analysis, and mathematical modeling. Basic deterministic methods used in the course are linear programming, simplex method, duality, dual simplex method, post-optimality analysis, integer programming, formulation, branch and bound technique, cutting plane algorithm, simple network models, minimal spanning tree algorithm, Dijikstra's algorithm and maximal flow algorithm, nonlinear programming, unconstrained nonlinear optimization and Lagrange multiplier method.
Pre-requisite: MATH241, IENG212

IENG323 Engineering Economy (4 - 1 - 0) 4
The purpose of this course is to give an introduction to economic analysis for decision making in engineering design, manufacturing equipment and industrial projects. Cost concepts. Subjects covered are time-value of money, cash-flow analysis, cost-benefit analysis, decision making among alternatives (present worth, equivalent-uniform annual worth and rate-of-return methods), replacement analysis, after tax analysis, breakeven analysis, capital budgeting, and inflation.

IENG372 Information Systems and Technology (4 - 1 - 0) 4
The purpose of this course is to give the Industrial Engineering students the concepts of information technology and the importance of these concepts within the framework of management of organization and the ability to exploit continuous innovations in order to stay competitive in business. Information Technology. Basic data information concepts. Appropriate theoretical concepts of decision making. Systems Analysis, Structured analysis methodologies. Information systems development methodologies. Database management. Decision support systems. Expert systems.
Pre-requisite: MGMT201

IENG310 Industrial Training – II 0-credit
This is the second Industrial Training course for the students. In partial fulfillment of graduation requirements each student is required to complete three industrial training in accordance with rules and regulations set by the Department. Students will have the chance to observe real world Industrial Engineering practices in the firms, discuss the various aspects of the production processes in an organization and write a formal report based on the questions and tasks provided in the Log-Book. During the training students should visit at least 5 departments, including manufacturing and assembling.
Co-requisite: IENG210 and completion of all freshman courses

IENG301 Fundamentals of Work Study and Ergonomics (4 - 1 - 0) 4
This course is designed to teach the fundamentals of Work Study and Ergonomics, which are both used in the examination of human and work in all their contexts. Work Study topics covered in the course are: methods study, charting techniques, time study, work-station design principles, job evaluation and compensation. The topics covered in Ergonomics are human physiology and anthropometry, fatigue assessment, industrial hygiene, information retrieval and control in humans, and fundamentals of industrial product design. Industrial accidents, theories on causes of accidents, safety analysis and hazard prevention.
Co-requisites: IENG263, IENG210

IENG314 Operations Research – II (4 - 1 - 0) 4
This course introduces uncertainty, risk, and probabilistic approaches to Operations Research. Elementary mathematical models and topics to be covered in this course are : review of probability theory with illustrations from inventory; decision analysis; decision trees and Bayes rule; utility theory approach; Markov chain models, Chapman-Kolmogorov equations, steady-state probabilities and their computation and applications; M/M/c infinite and finite capacity queuing models and optimization, queuing networks; two-person, constant and non-constant sum games , their analysis and applications.
Pre-requisite: MATH322 & Co-requisite: IENG313

IENG332 Production Planning – I (4 - 1 - 0) 4
Two sequel courses are designed together to provide the basics of production planning and control with the need of modern manufacturing organizations in mind. The topics covered in the first course are production and

operations strategy, subjective and objective forecasting (i.e. Delphi method, trend-based methods, and methods for seasonal series), deterministic inventory planning and control (i.e. Economic Order Quantity model and its extensions to several environments), stochastic inventory planning and control, aggregate production planning, and master production scheduling.
Pre-requisite: IENG212, MATH322

IENG385 Statistical Applications in Engineering (3 – 0 – 1) 3
The purpose of the course is to introduce and train students in the application of statistical tools and techniques in industries and other areas. We first introduce students to an array of statistical tools used in presenting and interpreting statistical data. After a brief review of probability distributions, estimation procedures of statistical parameters will be presented. These will include parametric, nonparametric and interval estimation procedures. Testing of statistical hypotheses under various assumptions will be presented. Finally, correlation and regression analysis of bivariate data will be introduced.
Co-requisite: MATH322

IENG431 Production Planning – II (4 - 1- 0) 4
This course is a continuation of IENG332, Production Planning - I. The topics covered in the course are materials requirements planning, lot sizing, capacity planning, machine scheduling and loading, project scheduling in production environments, recent advances in production and operations management such as Just-in-time Production (JIT), Flexible Manufacturing Systems (FMS), and Optimized Production Technology (OPT).
Pre-requisite: IENG332

IENG441 Facilities Planning and Design (4 - 1 - 0) 4
The purpose of this course is to make an introduction to planning and design of manufacturing facilities. A balance of traditional and analytical approaches to facilities planning will be presented. Principles of management and facility organization. Capacity and technology selection. Analysis of production plans and processes to compute equipment and manpower requirements. Facility location. Plant layout. Identification of production support activities such as receiving, inventory management, material handling, storage and warehousing, packaging and shipping, maintenance planning.
Pre-requisite: IENG301 & Co-requisite: IENG332

IENG461 Systems Modeling and Simulation (4 - 1 - 0) 4
The aim of this course is to give our students a decision tool in order to design and analyze complicated real life systems for which there is no well formulated solution. Emphasis is primarily on applications in the areas of production management through the analysis of respective computer simulation models. Use and misuse of simulation as a decision tool. Simulation methodology and model building. Modeling with a simulation language. Random variate generation. Basic issues in the design, verification and validation of computer simulation models. Statistical analysis of simulation output data. Use of simulation for estimation and comparison of alternatives.
Pre-requisite: MATH322 & Co-requisite: IENG385

IENG490 Introduction to Manufacturing and Service Systems Design (1 – 0 - 1) 1
The course aims to prepare the senior year students for their Manufacturing and Service Systems Design Project course (IENG492). The students are first introduced to the type of the manufacturing or service system that they are going to design as the requirement of IENG492 during the next academic semester. Then they are asked to conduct a market survey, submit information on the types of products/services they are going to produce, amount of sales, prices, competing producers, processes required to producing and distributing them, and relevant standards/laws/rules and regulations available in the place where the system will be established. Additionally, students are required to design the products/services, make forecasting for their sales, and prepare a feasibility study of the system.
Co-requisite: IENG310

IENG410 Industrial Training – III 0-credit
This is the third Industrial Training course for the students. In partial fulfillment of graduation requirements each student is required to complete three industrial training in accordance with rules and regulations set by the Department. The aim of the training is to give students opportunity to observe real world industrial engineering practices in a firm, participate and appreciate interdisciplinary team work, and write a formal report based on the questions and tasks provided in the Log-Book. Additionally, students must identify and define an industrial engineering related problem (IE Problem) in the company, and formulate and propose an acceptable solution based on the knowledge obtained in the curriculum courses. During the training a visit of at least 5 departments is required.
Co-requisite: IENG310

IENG484 Quality Engineering (4 - 1 - 0) 4
The purpose of the course is to make an introduction and lay the foundations of modern methods of statistical quality control and improvements that are used in the manufacturing and service industries. The course also introduces basics of experimental design in determining quality products and reliability models. The students will first be introduced to some of the philosophies of quality control experts and their impact on quality. After a quick review of normal probability distribution, a few graphical methods used to monitor quality improvement will be given. Control charts for variables and attributes will be given with examples. Acceptance sampling plans for variables and attributes are to follow. Principles of design of experiments along with Taguchi method will be presented. Finally reliability of systems like series, parallel, series – parallel and parallel – series systems and their design will be discussed.
Pre-requisite: MATH322, IENG385

IENG492 Manufacturing and Service Systems Design Project (3 - 1 - 0) 3
The course consists of a design study of complex manufacturing or service systems. The study includes computer integrated modeling based on multiple realistic constraints such as demand, materials, capacity, location, man-machine, and information requirements. It is a project oriented course that is basically a synthesis of the techniques and methodologies previously covered in other courses. Projects are implemented conforming relevant standards, ethical issues and environmental policies.
Pre-requisite: IENG490 & Co-requisite: IENG441, submission of IENG410 report.

IENG444 Seminars on Manufacturing and Service Systems 0-credit
The purpose of this course is to introduce students to the work atmosphere and opportunities available in the manufacturing and service sectors in TRNC and Türkiye. Throughout this course, a series of seminars will be given by invited speakers on issues of current interest to the practice of industrial engineering in various manufacturing and service systems. Additionally, seminars about continuing education in IE related fields, research opportunities at other universities, or subjects that will broaden the horizons of IE students may be presented.
Pre-requisite: In the last Spring semester before graduation

Area Elective Courses

IENG374 *Computational Modeling in IE (3,1) 3*
The aim of this course is to provide students with a sound understanding of the use of computational modeling techniques applied to Industrial Engineering problems. Students should develop an understanding of the strengths and limitations of standard numerical techniques in engineering. Spreadsheets, computer algebra systems (computational/symbolic processing software packages), and a structured programming language will be introduced. Emphasis is primarily on applications in the areas of production management, operations research and system design. This course will cover elementary numerical analysis, number representation, roots of equations, system of linear algebraic equations, non-linear equations, curve fitting, regression, integration and differentiation, finite difference methods, linear programming, initial-value and boundary-value problems.
Co-requisite: IENG212

IENG405 *Human Factors Engineering (3,1) 3*
This course is designed to introduce basic research methods and principles in ergonomics that can provide us with more efficient and comfortable places in which to work and live. This will be explored by considering body and work physiology, biomechanics, anthropometry, information processing and environmental factors (the effect of thermal factors, noise, vibration, illumination). Study of human performance by analysis of process involved in executing complex tasks and identification of factors. The effect of control display design, age and shift work on the performance of human beings will also be explored. Analysis of factors that limit human performance and development of skills. Human factors that affect product and workplace environment design.
Pre-requisite: IENG301 and/or consent of the instructor

IENG409 *Occupational Safety and Health Management (3,0) 3*
This course is designed to introduce the engineering student with the basic principles of occupational safety and health management in industry. Development of safety and health function, concepts of hazard avoidance, impact of regulations, toxic substances, environmental control, noise, explosive materials, fire protection, personal protection and first aid will be introduced.

IENG416 ***Network Analysis*** ***(3,1) 3***
Basic definitions and concepts in graph theory and network systems are presented in this course. The course concentrates on applications of network algorithms to project management. Basic network topics covered in this course are: minimal and maximal paths, flow networks, activity networks.
Pre-requisite: IENG313 and/or consent of the instructor

IENG417 ***Applications in Mathematical Programming and Optimization*** ***(3,1) 3***
The aim of this course is to improve the skills of students in modeling and solving real life problems in the mathematical programming and optimization. Both deterministic and stochastic models are considered. Topics covered are: numerical methods and their implications in linear programming; introduction to non-linear and dynamic programming; techniques to solve Markov decision problems.
Pre-requisite: IENG314 and/or consent of the instructor

IENG418 ***Stochastic Processes*** ***(3,1) 3***
This technical elective course is designed for students who are interested in stochastic systems. The course provides a review of probabilistic concepts and basic definitions and constructions of stochastic processes. Analysis of Bernoulli and Poisson processes, Markov chains, birth and death processes, Chapman Kolmogorov equations, Markov decision processes are main subjects of the course. Other topics covered in the course are: applications to queuing and inventory problems, basic results of M/G/1 and GI/G/1 queuing models, renewal theory and its applications.
Pre-requisite: MATH322 and/or consent of the instructor

IENG419 ***Project Management*** ***(3,1) 3***
This course is designed to familiarize the student with the basic techniques used in the management of projects. It covers: project management: nature and organization; financial and commercial framework; definition, cost estimating, contracts and funding; planning and scheduling; network analysis including CPM & PERT, scheduling resources; computer applications: preparation, packages; purchasing and materials management: scheduling, ordering, materials control, purchasing procedures; managing work and costs: program implementation, managing progress, commissioning, permits, cost management; decommissioning; project closure.
Pre-requisite: senior standing and/or consent of the instructor

IENG426 ***Multi-attribute Decision Making*** ***(3,1) 3***
The aim of this course is to introduce the basic techniques used in decision making for complex systems. Theory and methods that are used to analyze multi-attribute decision problems under certainty, uncertainty and risk are discussed. Topics covered in the course include: the value of information, the concept of utility function, expected utility theory, decision trees, portfolio theory, and formulation of the multi-attribute problem, decision making with discrete and continuous alternatives. Applications selected from capital investment, bidding, marketing, purchasing and inventory control will also be provided.
Pre-requisite: IENG313 and/or consent of the instructor

IENG435 ***Advanced Topics in Inventory Planning and Control*** ***(3,1) 3***
The aim of this course is to study the practical and advanced theoretical issues in inventory planning and control. The topics covered in the course are: an overview of inventory systems, deterministic and stochastic models, fixed versus variable reorder intervals, dynamic and multiple stage models, selection of optimal inventory policies for single and multiple item dynamic inventory models, myopic policies, multiple echelon models, and heuristic algorithms.
Pre-requisite: IENG332 and/or consent of the instructor

IENG436 ***Machine Scheduling*** ***(3,1) 3***
This course is designed to provide theoretical and practical issues in machine scheduling. Terminology, characteristics and classification of sequencing and scheduling problems. An overview of computational complexity theory. Scheduling approaches. Static and dynamic scheduling problems: single stage and multi-stage (flow shop, open shop, job shop, etc.) problems with various scheduling criteria. Priority dispatching. Survey of other scheduling problems. Applications in production and computer systems.
Pre-requisite: IENG431 and/or consent of the instructor

IENG438 ***Fundamentals of Supply Chain Management*** ***(3,1) 3***
Supply chain management; Performance of supply chain and it's measurement; Different structures of supply chains; Planning in supply chain including demand forecasting, aggregate planning, and planning of demand and supply; Planning and managing inventories in supply chain; Information sharing; Designing and planning logistic systems of supply chain. New product development; Planning, managing and controlling of purchasing

and logistics systems of supply chain; Strategic orientation toward the design and development of the supply chain; Bull-whip effect; Total Quality Management to assess and assure customer satisfaction; Global strategies; Expert systems for continuous improvement of the supply chain.
Pre-requisite: Senior standing and/or consent of the instructor

IENG446 ***Advanced Manufacturing Technologies (3,1) 3***
This course is designed to cover the advanced issues in design, planning, and analysis of performance issues in production systems, production/inventory systems and network of production/inventory and distribution systems. Production and transfer lines. Assembly systems. Impact of computer aided design and manufacturing on production planning. Manufacturing information systems, classification and coding; i.e., Group Technology. Characteristics of Cellular Manufacturing, Flexible Manufacturing and Just-in-Time Production Systems. Automated material handling systems. Consideration of technical and economic aspects of equipment, process and system design. This project oriented course requires extensive use of simulation in analysis of system performances.
Pre-requisite: IENG431, IENG461 and/or consent of the instructor

IENG447 ***Computer Integrated Manufacturing (3,1) 3***
This course is designed to teach the basics of computer integrated manufacturing. Topics covered in this course are: CIM definition. CIM environment, CIM benefits, Components of a CIM Architecture: Simulation, Group Technology, Networks, Concurrent Engineering, CAD/CAM. Classification of production systems for the design and selection of production planning and control. Integrative Manufacturing Planning and Control. Integration of information and material flow in manufacturing. Developing a successful CIM strategy. CIM Examples. Modeling Methodology and tools in analysis and design for CIM. Application of virtual reality in CIM.
Pre-requisite: IENG431 and/or consent of the instructor

IENG448 ***Service Systems (3,1) 3***
This course is aimed to analyze service systems from the perspective of an industrial engineer. Structure of service producing systems and representation of them as production systems are discussed in the course. Topics covered in this course are: basic design and operational concepts in service and process selection, capacity planning, facilities planning, work design, aggregate service planning, scheduling, service quality information systems.
Pre-requisite: IENG314 and/or consent of the instructor

IENG452 ***Introduction to Entrepreneurship (3,0) 3***
This interdisciplinary course is designed to help students to evaluate the business skills and commitment necessary to successfully operate an entrepreneurial venture and review the challenges and rewards of entrepreneurship. The core of the course focuses on the discovery and understanding of entrepreneurial attitudes and behaviors within oneself. Students will also be introduced to entrepreneurship from an economic perspective and the concepts of environmentally sustainable practices and social entrepreneurship. The students will be given the competencies required to be an entrepreneur through case studies, creative problem solving and exercises aimed at self-development.

IENG455 ***Engineering Management (3,0) 3***
This course is designed to introduce engineering management principles to students. It aims to educate engineering students how to assume management positions in engineering organizations. It covers the historical developments in this area, the organizational issues, motivating engineers, managing the activities of design, production and manufacturing, and managing engineering projects.
Pre-requisite: senior standing and/or consent of the instructor

IENG456 ***Technology Management (3,0) 3***
The aim of this course is to teach the basics of technology management to senior industrial engineering students. It covers the major technological aspects of process and manufacturing industries in relation to their management, selection and implementation issues of new technologies, managing technological and the related organizational changes.
Pre-requisite: senior standing and/or consent of the instructor

IENG457 ***R & D Management and Technology Transfer (3,0) 3***
This course is designed to prepare senior industrial engineering students to assume positions in a research and development environment. The process of technological innovation and its relationships to organization, management of R & D, transfer of technology from laboratories to industry, and license and patent agreements are among the topics studied.
Pre-requisite: senior standing and/or consent of the instructor

IENG458 ***Legal Environment*** ***(3,0)*** **3**
The aim of this course is to introduce the fundamental concepts and terminology used in the study of the effects of the legal environment on the decisions which the engineer as a manager must make. Formulation of employment contracts. Health and safety at work. Occupational accidents. Employers' liabilities. Collective bargaining. Collective agreement. Conciliation and arbitration. Strikes and lock-outs. Social security. Legal provisions.
Pre-requisite: senior standing and/or consent of the instructor

IENG462 ***Fundamentals of Systems Engineering*** ***(3,1) 3***
This course introduces the fundamentals of large-scale system design to senior IE students. First, the concepts underlying Systems Engineering are covered, distinguishing Systems Engineering from classical bottom-up engineering. It then develops a methodology for working with these concepts and shows all the specialist sub disciplines, including life cycle costing, reliability, and maintainability have to be integrated into the top-down design process in order to achieve the overall goal of maximum cost-effectiveness.
Pre-requisite: concurrently with IENG314

IENG465 ***System Dynamics*** ***(3,1) 3***
The aim of this course is to teach how to study and investigate structural and operational properties of complex industrial systems through the System Dynamics approach. The topics covered are: development of system dynamics, principle areas of application and techniques used, structures of dynamic systems, formation of identity models, introduction to DYNAMO, analysis of positive and negative feedback flows and S-shaped growth behavior.
Pre-requisite: IENG461 and/or consent of the instructor

IENG476 ***Artificial Intelligence and Expert Systems*** ***(3,1) 3***
This course is designed to make an overview on the advanced topics in artificial intelligence and expert systems. Problem representation and reasoning. Problem modeling. Problem-solving techniques: state-space approach and problem-reduction approach. Proof theory of prepositional logic. First order predicate logic. Knowledge base, expert systems. Inference engine. Machine learning: inductive inference, analog inference and adductive inference. Learning by instruction. Learning from examples. Conceptual clustering. Explanation-based learning. Connectionist learning (neural networks). Industrial applications and robotics.
Pre-requisite: IENG372 and/or consent of the instructor

IENG485 ***Forecasting and Time Series Analysis*** ***(3,1) 3***
This course is designed to give some advanced forecasting models for discrete time series. Identification and estimation of parameters in autoregressive moving average. Mixed autoregressive moving average processes. Autocorrelation functions. Box-Jenkins approaches to problems of identification. Estimation and forecasting. Linear stationary and non-stationary models. Kalman filters. Bayesian forecasting techniques.
Pre-requisite: IENG332, IENG385 and/or consent of the instructor

IENG486 ***Recent Topics in Quality Management*** ***(3,1) 3***
This course is designed to answer the question on ''how quality can be achieved in all areas of an organization, including design, production, marketing, customer services and personnel''. History of quality. Development of basic quality control concepts. Basic statistical methods employed in the assurance of product conformance to specifications in the industrial environment. Quality engineering in product and process design and quality costs. Understanding of total quality concept and the scope of Total Quality Management. Continuous improvement through Total Quality Management.
Pre-requisite: senior standing and/or consent of the instructor

IENG487 ***Design and Analysis of Experiments*** ***(3,1) 3***
The aim of this course is to introduce basic principles of experimental design. Replication. Randomization. Blocking. Transformations. Fixed and random effects. Latin squares. Factorial experiments. Analysis of variance and covariance. Regression analysis. Response surfaces.
Pre-requisite: IENG385 and/or consent of the instructor

IENG488 ***Reliability Engineering*** ***(3,1) 3***
In this course, the system reliability is introduced, and analysis of deterministic, probabilistic and stochastic reliability models are discussed. Topics covered include: coherent structures, min-path and min-cut representations, computing system reliability, systems with associated components, bounds on system reliability, classes of life distributions, optimal management of systems by replacement and preventive maintenance.
Pre-requisite: MATH322 and/or consent of the instructor

IENG495 ***Introduction to Research in Industry*** ***(3,0) 3***
This course is designed for the students who wish to conduct research in industrial engineering. Each student is assigned a research topic that is suitable to his/her academic background and interests. Under the supervision of a departmental faculty member, the student will tackle the problem and find a satisfactory solution. Written and oral presentations of results are required.
Prerequisite: Senior standing and/or consent of the instructor

CMPE428 ***Data Science*** ***(4,1) 4***
Introduction to data science process and its lifecycle. The role of data scientist, problem definition, data preparation, model planning and building, delivery of the results. Introduction to R and Rstudio. Graphical user interfaces, data import from different sources such as csv, xls, JSON, SPSS, SAS, ARFF and online sources (URLs). Attributes and their types. Vectors, matrices, lists and classes in R. Data frames and operations on data frames. Data Exploration and wrangling using R. Cleaning data. Data Visualization using ggplot2. Supervised versus unsupervised learning from data. Clustering for unsupervised learning. Supervised learning for regression and evaluation of the models in terms of degree of fit. Logistic regression models. Classification models. Decision trees and naïve Bayes classifier. Implementation of the classifiers and their evaluation. Performance metrics. Extraction and selection of attributes. Dimensionality reduction using principal component analysis and exploratory factor analysis. Selecting most discriminative attributes using forward and backward selection methods. Visualization of high-dimensional data using principal components. (Pre-requisite: CMPE110, MATH322)

CMPE461 ***Artificial Intelligence*** ***(4,1) 4***
Definitions of AI from different point of views, intelligent agents and agent architectures, rational intelligent agents, how agents should act and environments of intelligent agents. Problem solving agents, formulating problems, and searching for solutions. Uninformed search strategies: BFS, DFS, DLFS, IDFS. Informed search methods: Greedy algorithms, uniform cost search, heuristic functions, A*-search, memory-bounded search, iterative improvement algorithms. Constraint satisfaction problems (CSPs): Definitions, Backtracking search for CSPs, The structure of SCPs. Adversarial search: Games, Optimal decisions in games. Alpha-Beta pruning. Agents that reason logically: knowledge-based agents, representation of knowledge, reasoning, logic, and inference in propositional logic. First-order logic: syntax and semantics, extensions and notational variations, elements of first order logic, and inference in first-order logic. (Pre-requisite: CMPE110)

MGMT477 ***Business Processes and ERP Systems*** ***(3,1) 3***
The course participant will have a broad theoretical and practical knowledge of the SAP ERP system on completion of the course due to a wide range of practical experience and detailed explanations on the individual SAP ERP modules. This specifically applies to technical aspects, organizational structure, and integration of a number of business processes and functions.

CMPE211 ***Object-Oriented Programming*** ***(4, 1) 4***
Basics of C++ and Control structures. Program design, Object-Oriented programming and its specific features. Layout of a simple C++ program (elementary C++ programming. Fundamental types, scope. Overview of selection and iteration structures of C and C++ languages. Examples of C++ programs. Functions and Arrays. Review of functions and arrays. Prototypes (declarations), function definition, function overloading, inline functions, scope resolution operator (::), call-by-value, call-by-reference (reference parameters), default arguments, array declarations, operations on arrays, using arrays as function arguments. Pointers, C strings and C++ strings. Pointer variables, declaration and initialization. Use of pointers in call-by-reference function calls, returning a reference, arrays of pointers, pointers to arrays, pointers to functions, dynamic memory allocation with C++ operators new and delete, C-strings, input/output operations, standard C-string functions, formatted and unformatted input /output, C++ string type (the standard string class). Classes and Data abstraction. Structure definition, accessing members of structures, class declarations, constructors, constructor initialization lists. Class destructor, member access specifiers public and private, const member functions, friend functions and classes, static data and function members. Operator Overloading. Fundamentals and restrictions of operator overloading, this pointer, overloading unary and binary operators. Composition and Inheritance. Base classes and derived classes, protected class members, virtual functions and polymorphism, virtual destructors, private access vs. protected access, abstract base classes. Revision of the material discussed in the course. (Pre-requisite: CMPE110)

CMPE231 ***Data Structures*** ***(4, 1) 4***
Data types. Binary and decimal Integers. Floating point number. Pointers. Arrays. Structures. Array of structures. Self-referential structures. Dynamic memory allocation. Concept of Abstract Data Type (ADT). Memory allocation of arrays. Linked lists (singly linked, doubly linked, circular). Dynamic implementation of lists. The stack. Infix, postfix, and prefix notations. Applications of the stack: Infix-to-postfix conversion,

evaluation of postfix expressions. Recursion. Binary search. The towers of Hanoi problem. Queues. Trees and their applications. Binary tree representations. Binary tree traversals. Binary search trees (definition, operations). Heaps (Pre-requisite: CMPE110)

CMPE342 ***Systems Programming*** ***(4, 1) 4***

Systems programming in an OS environment. UNIX and the objectives of systems programming in UNIX. A program in the UNIX environment. Command line parameters. System calls and their classification. System calls for interprocess communication and for networking programming. Processes as fundamental objects in UNIX. Creating a process. Process ID. Parent process ID. Child process ID. More about the fork() system call. A family of exec() system calls. Basic concepts of threads and multithreaded programming. Interprocess communication, its purpose and using in systems programs. Mechanisms of interprocess communication in UNIX. Importance of interprocess communication for computer networks. A client-server paradigm of interprocess communication in networks. Unnamed and named pipes for interprocess communication. Message queues, shared memory, signals and semaphores. Sockets and their using for interprocess communication in computer networks. Client/Server model and its implementation with sockets in computer networks. Using IP addresses and port numbers with sockets. TCP and UDP sockets for communication in networks. Organization of a Web client-server network system. Remote procedure call (RPC) for networks, its operation and parameter passing. Introductory concepts of systems and network programming in Windows operating systems. TCP and UDP sockets for network communication in Windows environment. (Pre-requisite: CMPE110, CMPE231)

CMPE353 ***Database Management Systems*** ***(4, 1) 4***

This course introduces the student to the fundamentals of database management. Topics covered include: the Entity-Relationship model; the Relational model and its mathematical foundations; most important features of Structured Query Language (including basic structure, aggregate functions, nested queries, index definition, stored procedures and functions, views, database modification, domain constraints, assertions, triggers, transaction definition, data definition language, granting privileges, security), query languages Datalog and QBE; Object-Oriented and Object-Relational databases; design principles of Relational databases (normal forms, functional dependencies, decomposition). (Prerequisites: CMPE110, CMPE231)

CMPE416 ***Object-Oriented Programming and Graphical User Interfaces*** ***(4, 1) 4***

The purpose of this course is to expose the Object Oriented Programming approach and its use in building Graphical User Interfaces. It will be done in fact through the presentation of the JAVA language. The student is to learn the language structure of JAVA, its object oriented aspect, the similarities and differences with C. He must also acquire a practical programming experience in Java through a number of exercises and projects. Concerning the applications of the language, we will focus on the implementation of Graphical User Interfaces as well as animation programs. Blueprints and a practical object oriented development methodology will be given for such applications. (Pre-requisite: CMPE110, CMPE211)

CMPE418 ***Internet Programming*** ***(4, 1) 4***

This course is an introduction to the tools, technologies, and languages used for the design and implementation of Web applications. Hypertext Markup Language (HTML), Cascading Style Sheets (CSS), Extensible Markup Language (XML), Extensible Stylesheet Language transformations (XSLT), JavaScript and AJAX are covered for programming on the client side. XML Web services, a scripting language and the corresponding Web application development environment, session tracking, and using database are covered for programming on the server side. (Pre-requisite. CMPE110, CMPE353)

CMPE419 ***Mobile Application Development*** ***(4, 1) 4***

This course is an introduction to mobile device programming that will cover the fundamental programming principles, software architecture and their development environments. Event-driven programming, object-oriented programming, graphical user interface design, database programing and developing Internet based applications for mobile devices will be the main topics of this course.

MANAGEMENT ENGINEERING

The Management Engineering program is offering a Bachelor of Science degree in Management Engineering. The program is designed with the aim of providing an interdisciplinary foundation to its graduates to integrating complex technical understanding with high-level management skills by gaining depth in business administration principles and applications while being able to use the complex technical knowledge with a holistic view and capability of integrating all kind of relevant information in making decisions. With their complex knowledge of management and engineering, graduates of this program are prepared to design and provide solutions for manufacturing and service organizations, take leadership roles in their place of work, or pursuing research work at graduate level.

The Management Engineering program requires a total of 144 credit hours: 12 credit hours from university core, 20 credit hours from faculty core, 94 credit hours from area core, 9 credit hours from area electives, and 9 credit hours from university electives. Regular course load for students in Management Engineering program during fall or spring semesters is 5 or 6 credited courses (between 15-19 credit hours) whereas in summer semester the students can take at most 2 courses.

The first year of the Management Engineering program is dedicated to foundation courses in mathematics and basic sciences (freshman calculus, physics, and chemistry), and some University core courses. The program includes courses like computing and programming, engineering graphics, and courses on management skills. Apart from calculus courses there are two concentrated mathematics courses on Linear Algebra & Differential Equations, and Probability & Statistics. Students are also required to take two courses on Communication in English. Additionally, Management Engineering program offers flexibility for students to build up their background with elective courses according to their own career goals. The program undergraduate curriculum culminates in a two-semester capstone senior design course sequence that should have a significant design component with formal reports. At the end of each semester, a presentation is given before faculty, students, guests, and if possible sponsors. Teams of students device solutions to engineering problems submitted by faculty, or if possible industry and the community at large.

Courses offered by the program are focused on the following core topics: Operations Research, Work Study and Ergonomics, Engineering Economy, Production Planning, Simulation, Information Systems, Facilities Planning and Design, Quality Engineering. Case studies, laboratory work, intensive computer usage and technical report writing are among the requirements of most coursework. Additionally students have to complete three industrial training practices.

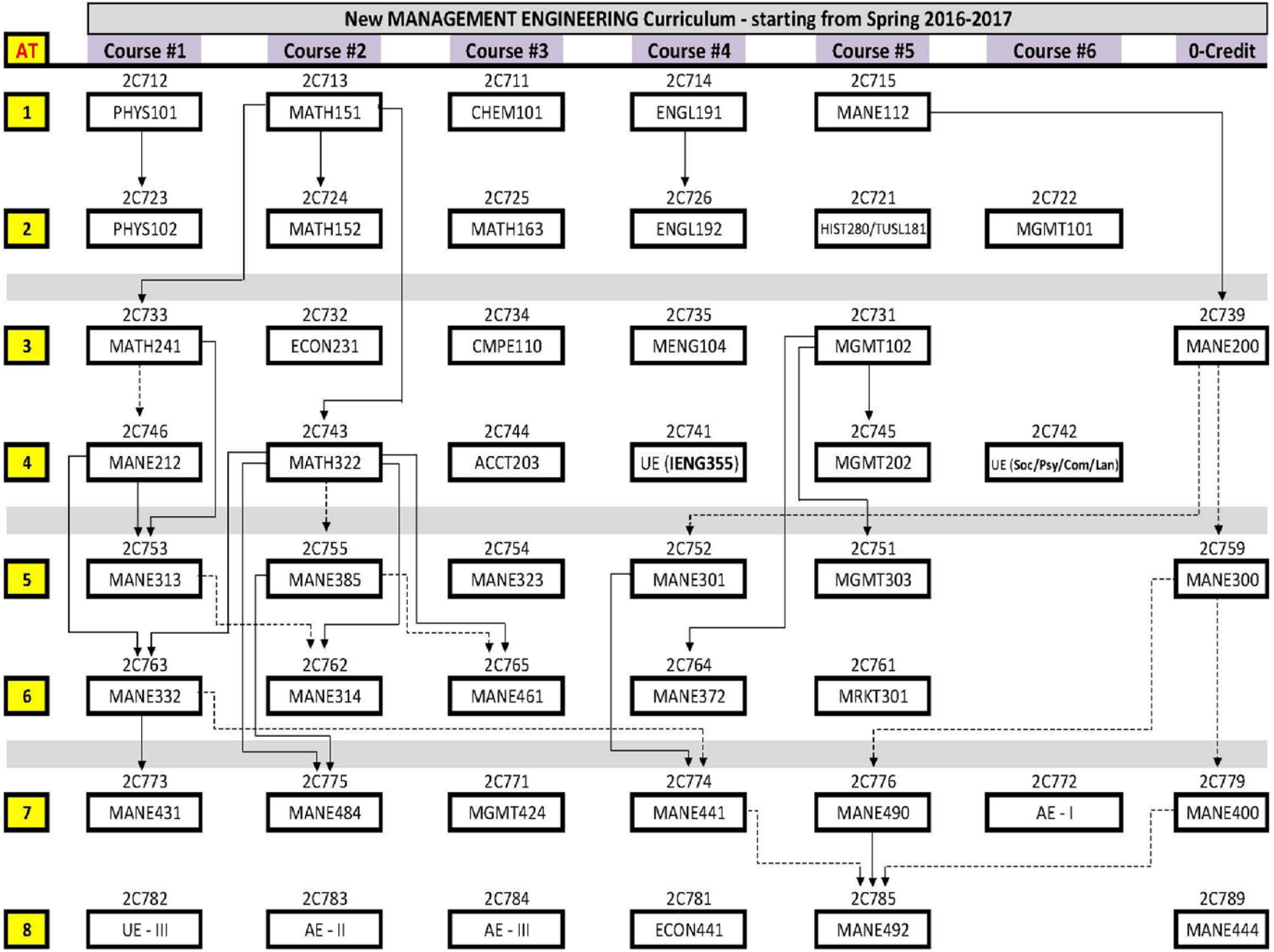
To earn the degree students must successfully complete 47 courses, of which 4 are non-credit, namely Industrial Training – I (MANE200), Industrial Training – II (MANE300), Industrial Training – III (MANE400) and Seminars on Manufacturing and Service Sustems (MANE444).

HIST280 and TUSL181 courses

All international students who are not native speakers of Turkish must take TUSL181, and all students who are citizens of Republic of Turkey and the Turkish Republic of Northern Cyprus must take HIST280.

Ref. Code	Course Code	Course Title	Credit	Pre-requisite (P) & Co-requisite (C)
		FRESHMAN YEAR		
Fall Semester				
2C711	CHEM101	General Chemistry	4	
2C712	PHYS101	Physics – I	4	
2C713	MATH151	Calculus – I	4	
2C714	ENGL191	Communication in English – I	3	
2C715	MANE112	Introduction to Management Engineering	4	
Spring Semester				
2C721	HIST280 or TUSL181	History of Turkish Reforms or Communication in Turkish	2	
2C722	MGMT101	Introduction to Business-I	3	
2C723	PHYS102	Physics – II	4	PHYS101 (P)
2C724	MATH152	Calculus – II	4	MATH151 (P)
2C725	MATH163	Discrete Mathematics	3	
2C726	ENGL192	Communication in English – I	3	ENGL191 (P)
		SOPHOMORE YEAR		
Fall Semester				
2C731	MGMT102	Introduction to Business-II	3	
2C732	ECON231	Fundamentals of Economics	3	
2C733	MATH241	Linear Algebra & Ordinary Diff. Eq.	4	MATH151 (P)
2C734	CMPE110	Fund. of Computing & Programming	4	
2C735	MENG104	Engineering Graphics	3	
2C739	MANE200	Industrial Training-I	0	MANE112 (P)
Spring Semester				
2C741	UE-01	Univ. Elective (IENG355-Ethics in Eng.)	3	
2C742	UE-02	Univ. Elective	3	
2C743	MATH322	Probability and Statistical Methods	3	MATH151 (P)
2C744	ACCT203	Cost Acct. for Managerial Decision Making	3	
2C745	MGMT202	Organizational Behavior	3	MGMT102 (P)
2C746	MANE212	Modeling and Optimization	3	MATH241 (C)
		JUNIOR YEAR		
Fall Semester				
2C751	MGMT303	Human Resource Management	3	MGMT102 (P)
2C752	MANE301	Fundamental of Work Study and Ergonomics	4	MANE200 (C)
2C753	MANE313	Operations Research - I	4	MANE212 (P), MATH241 (P)
2C754	MANE323	Engineering Economy	4	
2C755	MANE385	Statistical Application in Engineering	3	MATH322 (C)
2C759	MANE300	Industrial Training – II	0	Completion of MANE200 & freshman courses
Spring Semester				
2C761	MRKT301	Marketing	3	
2C762	MANE314	Operations Research - II	4	MATH322 (P), MANE313 (C)
2C763	MANE332	Production Planning – I	4	MANE212 (P), MATH322 (P)
2C764	MANE372	Information Systems and Technology	4	MGMT102 (P)
2C765	MANE461	System Modeling and Simulation	4	MATH322 (P)
		SENIOR YEAR		
Fall Semester				
2C771	MGMT424	Business Policy	3	
2C772	AE-01	Area Elective – I	3	
2C773	MANE431	Production Planning - II	4	MANE332 (P)
2C774	MANE441	Facilities Planning and Design	4	MANE301 (P), MANE332 (C)
2C775	MANE484	Quality Engineering	4	MATH322 (P), MANE385 (P)
2C776	MANE490	Intro. to Manuf. and Service Systems Design	1	MANE300 (C), one semester before MANE492
2C779	MANE400	Industrial Training - III	0	MANE300 (C)
Spring Semester				
2C781	ECON441	Managerial Economics	3	
2C782	UE-03	University Elective	3	
2C783	AE-02	Area Elective - II	3	
2C784	AE-03	Area Elective - III	3	
2C785	MANE492	Manuf. and Service Systems Design Project	3	MANE490 (P), MANE400 (C), MANE441 (C)
2C789	MANE444	Seminars on Manuf. and Service Systems	0	In the last Spring semester before graduation

TOTAL CREDIT HOURS = 144


New MANAGEMENT ENGINEERING Curriculum - starting from Spring 2016-2017
AT
Course #1
Course #2
Course #3
Course #4
Course #5
Course #6
0-Credit
1
2C712 PHYS101
2C713 MATH151
2C711 CHEM101
2C714 ENGL191
2C715 MANE112
2
2C723 PHYS102
2C724 MATH152
2C725 MATH163
2C726 ENGL192
2C721 HIST280/TUSL181
2C722 MGMT101
3
2C733 MATH241
2C732 ECON231
2C734 CMPE110
2C735 MENG104
2C731 MGMT102
2C739 MANE200
4
2C746 MANE212
2C743 MATH322
2C744 ACCT203
2C741 UE (IENG355)
2C745 MGMT202
2C742 UE (Soc/Psy/Com/Lan)
5
2C753 MANE313
2C755 MANE385
2C754 MANE323
2C752 MANE301
2C751 MGMT303
2C759 MANE300
6
2C763 MANE332
2C762 MANE314
2C765 MANE461
2C764 MANE372
2C761 MRKT301
7
2C773 MANE431
2C775 MANE484
2C771 MGMT424
2C774 MANE441
2C776 MANE490
2C772 AE - I
2C779 MANE400
8
2C782 UE - III
2C783 AE - II
2C784 AE - III
2C781 ECON441
2C785 MANE492
2C789 MANE444

Curriculum Notes

Electives

A. Area Electives

Area Electives (AE) are courses, which provide a well-defined emphasis area for the students. These courses may help the student prepare for graduate study in a technical master's program or provide tools for better productivity as a practicing engineer in any industry. During the BS program in Management Engineering students must take 3 AE courses.

List of Departmental Area Electives:

Course Code	Course Title	Credit
IENG374	Computational Modeling in IE	(3,1) 3
IENG405	Human Factors Engineering	(3,1) 3
IENG409	Occupational Safety and Health Management	(3,0) 3
IENG416	Network Analysis	(3,1) 3
IENG417	Applications in Mathematical Programming and Optimization	(3,1) 3
IENG418	Stochastic Processes	(3,1) 3
IENG419	Project Management	(3,1) 3
IENG426	Multi-attribute Decision Making	(3,1) 3
IENG435	Advanced Topics in Inventory Planning and Control	(3,1) 3
IENG436	Machine Scheduling	(3,1) 3
IENG438	Fundamentals of Supply Chain Management	(3,1) 3
IENG446	Advanced Manufacturing Technologies	(3,1) 3
IENG447	Computer Integrated Manufacturing	(3,1) 3
IENG448	Service Systems	(3,1) 3
IENG452	Introduction to Entrepreneurship	(3,0) 3
IENG455	Engineering Management	(3,0) 3
IENG456	Technology Management	(3,0) 3
IENG457	R&D Management and Technology Transfer	(3,0) 3
IENG458	Legal Environment	(3,0) 3
IENG462	Fundamentals of Systems Engineering	(3,1) 3
IENG465	System Dynamics	(3,1) 3
IENG476	Artificial Intelligence and Expert Systems	(3,1) 3
IENG485	Forecasting and Time Series Analysis	(3,1) 3
IENG486	Recent Topics in Quality Management	(3,1) 3
IENG487	Design and Analysis of Experiments	(3,1) 3
IENG488	Reliability Engineering	(3,1) 3
IENG495	Introduction to Research in Industry	(3,0) 3

In addition to above courses, there are several courses from Computer Engineering, such as CMPE428 (Data Science), CMPE461 (Artificial Intelligence), and one course from Business Administration (MGMT477 – Business Processes and ERP Systems) that can be taken as AE. The Department may add other elective courses to the given list, and reserves the right to offer any of the area elective courses in any semester.

B. University Electives

There are 3 University Elective (UE) courses in BS program. First UE course is restricted to IENG355 (Ethics in Engineering). Second UE course must be chosen from a list of courses approved by the Department Council (SOCI100, SOCI212, PSYC100, PSYC250, PSYC435, PRAD102, PRAD206, PRAD233, PRAD303, PRAD402, COMM122, COMM321, COMM322, HIRE102 (in Turkish), HIRE206 (in Turkish), HIRE233 (in Turkish), HIRE303 (in Turkish), HIRE402 (in Turkish), ILET321 (in Turkish), ILET322 (in Turkish), PSKL100 (in Turkish), SOSY121 (in Turkish), **or** any Language course, like GERM111, RUSS111 etc.. Note that students are allowed to register **at most** one course in Turkish. The third UE course is completely free to choose.

Course Descriptions

CHEM101 General Chemistry (4,1) 4
Atoms, molecules and ions; Mass relations in chemistry, stoichiometry; Gasses, the ideal gas law, partial pressures, mole fractions, kinetic theory of gases; Electronic structure and the periodic table; Thermo chemistry, calorimetry, enthalpy, the first law of thermodynamics; Liquids and Solids; Solutions; Acids and Bases; Organic Chemistry.

PHYS101 Physics – I (4,1) 4
Physical quantities and units. Vector calculus. Kinematics of motion. Newton`s laws of motion and their applications. Work-energy theorem. Impulse and momentum. Rotational kinematics and dynamics. Static equilibrium.

MATH151 Calculus – I (4,1) 4
Limits and continuity. Derivatives. Rules of differentiation. Higher order derivatives. Chain rule. Related rates. Rolle's and the mean value theorem. Critical Points. Asymptotes. Curve sketching. Integrals. Fundamental Theorem. Techniques of integration. Definite integrals. Application to geometry and science. Indeterminate forms. L'Hospital's Rule. Improper integrals. Infinite series. Geometric series. Power series. Taylor series and binomial series.

ENGL191 Communication in English – I (3,1) 3
ENGL191 is a first semester freshman academic English course. The purpose of this course is to consolidate and develop students' knowledge and awareness of academic discourse, language structures and lexis. The prime focus will be on the further development of writing, reading, speaking and listening skills in academic settings, and on improving study skills in general.

MANE112 Introduction to Management Engineering (4,1) 4
This course is designed to introduce the fundamental concepts of Industrial/Management Engineering and give answers to the first questions that are usually asked by the prospective Industrial/Management Engineering students. The course surveys both the traditional and modern topics of Industrial/Management Engineering, providing a historical as well as an academic perspective of the whole profession. Related software applications, together with fundamentals of modeling & optimization, and production system design and control (methods engineering, work measurement, ergonomics, facilities planning and design, production planning, inventory control and quality control) will also be covered in the course.

TUSL181 Communication in Turkish (2,0) 2 – For international students only
A basic Turkish course introducing the Turkish language to international students. It incorporates all four language skills and provides an introduction to basic grammar structures. Students will be encouraged to develop their writing skills through a variety of tasks. The aim of this course is for students to be able to understand and communicate in everyday situations, both in the classroom and in a Turkish-speaking environment.

HIST280 History of Turkish Reforms (2,0) 2 – For Turkish students only
This course is for Turkish students only. The aim of the course is to introduce the Ottoman Empire's situation at the 19. Century, Trablus and Balkan Wars, I. World War and it's consequences, Turkish Independence War, Mudanya Treaty, Lausanne Treaty, and Principles of Ataturk.

MGMT101 Introduction To Business – I (3,0) 3
This is the first part of a two-part series of introductory courses in essentials of business management. The course is comprised of two parts: Part One deals with understanding of the contemporary business environment, in which topics covered include an understanding of the business system; the global context of business; conducting business ethically and responsibly; entrepreneurship and small businesses. Part Two focuses mainly on helping the student to understand the business of managing. In this part topics such as managing the business enterprise, organizing the business enterprise, and managing quality operations are covered.

PHYS102 Physics – II (4,1) 4
Kinetic theory of ideal gases. Equipartition of energy. Heat, heat transfer and heat conduction. Laws of thermodynamics, applications to engine cycles. Coulombs law and electrostatic fields. Gauss's law. Electric potential. Magnetic field. Amperes law. Faradays law.
Pre-requisite: PHYS101

MATH152 Calculus – II (4,1) 4
Vectors in R3. Lines and Planes. Functions of several variables. Limit and continuity. Partial differentiation. Chain rule. Tangent plane. Critical Points. Global and local extrema. Lagrange multipliers. Directional derivative. Gradient, Divergence and Curl. Multiple integrals with applications. Triple integrals with applications. Triple integral in cylindrical and spherical coordinates. Line, surface and volume integrals. Independence of path. Green's Theorem. Conservative vector fields. Divergence Theorem. Stokes' Theorem.
Pre-requisite: MATH151

MATH163 Discrete Mathematics (3,1) 3
Set theory, functions and relations; introduction to set theory, functions and relations, inductive proofs and recursive definitions. Combinatorics; basic counting rules, permutations, combinations, allocation problems, selection problems, the pigeonhole principle, the principle of inclusion and exclusion. Generating functions; ordinary generating functions and their applications. Recurrence relations; homogeneous recurrence relations, inhomogeneous recurrence relations, recurrence relations and generating functions, analysis of algorithms. Propositional calculus and boolean algebra; basic boolean functions, digital logic gates, minterm and maxterm expansions, the basic theorems of boolean algebra, simplifying boolean function with karnaugh maps. Graphs and trees; adjacency matrices, incidence matrices, eulerian graphs, hamiltonian graphs, colored graphs, planar graphs, spanning trees, minimal spanning trees, Prim's algorithm, shortest path problems, Dijkstra's algorithms.

ENGL192 Communication in English – II (3,1) 3
ENGL192 is a second semester freshman academic English course The purpose of this course is to further consolidate and develop students' knowledge and awareness of academic discourse, language structures and lexis. The prime focus will be on the further development of writing, reading, speaking and listening skills in academic settings, and on improving study skills in general.
Pre-requisite: ENGL191

MGMT102 Introduction to Business – II (3,0) 3
A basic introduction to business matters. Topics include: motivation and leadership; human resources and labor relations; marketing, information systems; money and banking; and securities and investments.

ECON231 Fundamentals of Economics (3,1) 3
The course will cover fundamental concepts of both macro- and microeconomics at the introductory level. Microeconomics aspects of the course include supply and demand; elasticity; market efficiency; cost of production; and profit maximization in competitive and monopolistic markets. Macroeconomics aspects include national income accounting; unemployment; inflation; LR and SR aggregate demand and supply curves; economic growth and international trade.

MATH241 Linear Algebra and Ordinary Differential Equations (4,1) 4
Systems of linear equations: Elementary row operations, echelon form, Gaussian elimination method; Matrices; determinants, adjoint and inverse matrices, Cramer's rule. Vector spaces. Linear independence, bases and dimensions; linear mappings. Eigenvalue problem. First-order differential equations, separable differential equations, change of variables, exact differential equations. Second-order differential equations; the method of undetermined coefficients, the variation of parameters method. Systems of differential equations. Vector formulation. General results of first order linear systems. Differential systems, Homogeneous constant coefficient vector differential equations. Variations of parameters for linear systems. Laplace Transform Method.
Pre-requisite: MATH151

CMPE110 Fundamentals of Computing and Programming (4,1) 4
Design of computer algorithms with pseudo-code to solve problems, analyze engineering related problems using computer. Basic elements of a high level computer programming language: Data types, constants and variables, arithmetic and logical operators and expressions. Fundamental components of Python programming language: Storing and manipulating user-input data, design and use of selection structures, design and use of repetition structures, lists and other data structures, functions dictionaries and sets, file input/output. Explain the fundamental concepts of object-oriented programming and concept of a class: Define encapsulation, inheritance, and polymorphism.

MENG104 Engineering Graphics (2,3) 3
Principles of engineering graphics with the emphasis on laboratory use of AUTOCAD software. Plane Geometry, geometrical constructions, joining of arcs, principles of orthographic projection, isometric and oblique drawing, principles of sectioning, reading engineering drawing from blueprints, building plans or electrical circuit diagrams.

MANE200 Industrial Training – I 0-credit
This is the first Industrial Training course for the students. In partial fulfillment of graduation requirements each student is required to complete three industrial training in accordance with rules and regulations set by the Department. In the training students are required to observe the organization as a whole and write a formal report based on the questions and tasks provided in the Log-Book.
Pre-requisite: MANE112

IENG355 Ethics in Engineering (3,0) 3 - **will be taken as the first University Elective (UE01)**
This course is designed to introduce moral rights and responsibilities of engineers in relation to society, employers, colleagues and clients. Analysis of ethical and value conflict in modern engineering practice. Importance of intellectual property rights and conflicting interests. Ethical aspects in engineering design, manufacturing, and operations. Cost-benefit-risk analysis and safety and occupational hazard considerations.

MATH322 Probability and Statistical Methods (3,1) 3
Introduction to probability and statistics. Operations on sets. Counting problems. Conditional probability and total probability formula, Bayes' theorem. Introduction to random variables, density and distribution functions. Expectation, variance and covariance. Basic distributions. Joint density and distribution function. Descriptive statistics. Estimation of parameters, maximum likelihood estimator. Hypothesis testing.
Pre-requisite: MATH151

ACCT203 Cost Accounting for Managerial Decision Making (3,1) 3
Understanding the balance sheet and income statement of a production firm. Calculation of costs of goods and services produced by production and service companies. Measurement and reporting of financial and nonfinancial information relating to cost of acquiring and utilizing resources within the organization. Use of cost accounting data for managerial decision making.

MGMT202 Organizational Behavior (3,0) 3
Introduction to organizational behavior. Motivation and leadership. Communication. Power and politics. The structure of organizations. Decision-making and control. Applications in behavior. Organization development.

MANE212 Modeling and Optimization (3,1) 3
This course is designed to install in students the ability of conceptualization of real life system in the form of mathematical models. Principles of model building and basic optimization concepts and approaches for problem solving will be discussed in detail. The application of these principles and concepts will be illustrated using simplified but practical problems from diverse fields of application in manufacturing and service systems. Scopes and limitations of suggested formulations will be discussed and their applications in real-life situations will be studied with the help of samples of computational experience. The emphasis will be on the building and interpretation of models rather than the solution processes.
Co-requisite: MATH241

MGMT303 Human Resource Management (3,0) 3
Basic objectives and concepts in human resources management. Fundamental functions of personnel management, such as human resources planning, job analysis, recruitment, selection, orientation, training and development, and personnel relations. Emerging trends in human resources management.

MANE301 Fundamentals of Work Study and Ergonomics (4,1) 4
This course is designed to teach the fundamentals of Work Study and Ergonomics, which are both used in the examination of human and work in all their contexts. Work Study topics covered in the course are: methods study, charting techniques, time study, work-station design principles, job evaluation and compensation. The topics covered in Ergonomics are human physiology and anthropometry, fatigue assessment, industrial hygiene, information retrieval and control in humans, and fundamentals of industrial product design. Industrial accidents, theories on causes of accidents, safety analysis and hazard prevention.
Co-requisite: MANE200

MANE313 Operations Research - I (4,1) 4
This course is designed to introduce the fundamentals of operations research. The emphasis is on solution of deterministic optimization models. The topics covered are application of scientific methodology to business problems, systems concept, team concept in problem analysis, and mathematical modeling. Basic deterministic methods used in the course are linear programming, simplex method, duality, dual simplex method, post-optimality analysis, integer programming, formulation, branch and bound technique, cutting plane algorithm, simple network models, minimal spanning tree algorithm, Dijikstra's algorithm and maximal flow algorithm, nonlinear programming, unconstrained nonlinear optimization and Lagrange multiplier method.
Pre-requisite: MANE212, MATH241

MANE323 Engineering Economy (4,1) 4
The purpose of this course is to give an introduction to economic analysis for decision making in engineering design, manufacturing equipment and industrial projects. Cost concepts. Subjects covered are time-value of money, cash-flow analysis, cost-benefit analysis, decision making among alternatives (present worth, equivalent-uniform annual worth and rate-of-return methods), replacement analysis, after tax analysis, breakeven analysis, capital budgeting, and inflation.

MANE385 Statistical Applications in Engineering (3,1) 3
The purpose of the course is to introduce and train students in the application of statistical tools and techniques in industries and other areas. We first introduce students to an array of statistical tools used in presenting and interpreting statistical data. After a brief review of probability distributions, estimation procedures of statistical parameters will be presented. These will include parametric, nonparametric and interval estimation procedures. Testing of statistical hypotheses under various assumptions will be presented. Finally, correlation and regression analysis of bivariate data will be introduced.
Co-requisite: MATH322

MANE300 Industrial Training - II 0-credit
This is the second Industrial Training course for the students. In partial fulfillment of graduation requirements each student is required to complete three industrial training in accordance with rules and regulations set by the Department. Students will have the chance to observe real world Industrial/Management Engineering practices in the firms, discuss the various aspects of the production processes in an organization and write a formal report based on the questions and tasks provided in the Log-Book. During the training students should visit at least 5 departments, including manufacturing and assembling.
Co-requisite: Submission of MANE200 report, and completion of all freshman courses

MRKT301 Marketing (3,0) 3
Consumer behavior. Market segmentation. Product development and policies, methods and practices. Distribution decisions. Marketing communications. Marketing research. International marketing. Contemporary issues in marketing.

MANE314 Operations Research - II (4,1) 4
This course introduces uncertainty, risk, and probabilistic approaches to Operations Research. Elementary mathematical models and topics to be covered in this course are : review of probability theory with illustrations from inventory; decision analysis; decision trees and Bayes rule; utility theory approach; Markov chain models, Chapman-Kolmogorov equations, steady-state probabilities and their computation and applications; M/M/c infinite and finite capacity queuing models and optimization, queuing networks; two-person, constant and non-constant sum games , their analysis and applications.
Pre-requisite: MATH322 & Co-requisite: MANE313

MANE332 Production Planning - I (4,1) 4
Two sequel courses are designed together to provide the basics of production planning and control with the need of modern manufacturing organizations in mind. The topics covered in the first course are production and operations strategy, subjective and objective forecasting (i.e. Delphi method, trend-based methods, and methods for seasonal series), deterministic inventory planning and control (i.e. Economic Order Quantity model and its extensions to several environments), stochastic inventory planning and control, aggregate production planning, and master production scheduling.
Pre-requisite: MANE212, MATH322

MANE372 Information Systems and Technology (4,1) 4
The purpose of this course is to give the Management Engineering students the concepts of information technology and the importance of these concepts within the framework of management of organization and the ability to exploit continuous innovations in order to stay competitive in business. Information Technology. Basic data information concepts. Appropriate theoretical concepts of decision making. Systems Analysis, Structured analysis methodologies. Information systems development methodologies. Database management. Decision support systems. Expert systems.
Pre-requisite: MGMT102

MANE461 Systems Modeling and Simulation (4,1) 4
The aim of this course is to give our students a decision tool in order to design and analyze complicated real life systems for which there is no well formulated solution. Emphasis is primarily on applications in the areas of production management through the analysis of respective computer simulation models. Use and misuse of simulation as a decision tool. Simulation methodology and model building. Modeling with a simulation

language. Random variate generation. Basic issues in the design, verification and validation of computer simulation models. Statistical analysis of simulation output data. Use of simulation for estimation and comparison of alternatives.
Pre-requisite: MATH322 & Co-requisite: MANE385

MGMT424 Business Policy (3,0) 3
Strategic Management elements and environment. The manager and management. Internal analysis and diagnosis. Computing: algorithms and data structures. Strategic implements; resource allocation, organization and control. Case analysis and corporate simulations. team works and presentation.

MANE431 Production Planning - II (4,1) 4
This course is a continuation of MANE332, Production Planning - I. The topics covered in the course are materials requirements planning, lot sizing, capacity planning, machine scheduling and loading, project scheduling in production environments, recent advances in production and operations management such as Just-in-time Production (JIT), Flexible Manufacturing Systems (FMS), and Optimized Production Technology (OPT).
Pre-requisite: MANE332

MANE441 Facilities Planning and Design (4,1) 4
The purpose of this course is to make an introduction to planning and design of manufacturing facilities. A balance of traditional and analytical approaches to facilities planning will be presented. Principles of management and facility organization. Capacity and technology selection. Analysis of production plans and processes to compute equipment and manpower requirements. Facility location. Plant layout. Identification of production support activities such as receiving, inventory management, material handling, storage and warehousing, packaging and shipping, maintenance planning.
Pre-requisite: MANE301 & Co-requisite: MANE332

MANE484 Quality Engineering (4,1) 4
The purpose of the course is to make an introduction and lay the foundations of modern methods of statistical quality control and improvements that are used in the manufacturing and service industries. The course also introduces basics of experimental design in determining quality products and reliability models. The students will first be introduced to some of the philosophies of quality control experts and their impact on quality. After a quick review of normal probability distribution, a few graphical methods used to monitor quality improvement will be given. Control charts for variables and attributes will be given with examples. Acceptance sampling plans for variables and attributes are to follow. Principles of design of experiments along with Taguchi method will be presented. Finally reliability of systems like series, parallel, series – parallel and parallel – series systems and their design will be discussed.
Pre-requisite: MATH322, MANE385

MANE490 Introduction to Manufacturing and Service Systems Design (1,1) 1
The course aims to prepare the senior year students for their Manufacturing and Service Systems Design Project course (MANE492). The students are first introduced to the type of the manufacturing or service system that they are going to design as the requirement of MANE492 during the next academic semester. Then they are asked to conduct a market survey, submit information on the types of products/services they are going to produce, amount of sales, prices, competing producers, processes required to producing and distributing them, and relevant standards/laws/rules and regulations available in the place where the system will be established. Additionally, students are required to design the products/services, make forecasting for their sales, and prepare a feasibility study of the system.
Co-requisite: Submission of MANE300 report, one semester prior to MANE492

MANE400 Industrial Training - III 0-credit
This is the third Industrial Training course for the students. In partial fulfillment of graduation requirements each student is required to complete three industrial training in accordance with rules and regulations set by the Department. The aim of the training is to give students opportunity to observe real world industrial/management engineering practices in a firm, participate and appreciate interdisciplinary team work, and write a formal report based on the questions and tasks provided in the Log-Book. Additionally, students must identify and define an industrial/management engineering related problem (IE/MANE Problem) in the company, and formulate and propose an acceptable solution based on the knowledge obtained in the curriculum courses. During the training a visit of at least 5 departments is required.
Co-requisite: Submission of MANE300 report

ECON441 Managerial Economics (3,0) 3
The course deals with the application of economic theory and quantitative methods to managerial decision-making problems. Topics include demand and supply analysis, production, cost analysis, forecasting, pricing, market structures, break-even analysis and capital budgeting.

MANE492 Manufacturing and Service Systems Design Project (3,1) 3
The course consists of a design study of complex manufacturing or service systems. The study includes computer integrated modeling based on multiple realistic constraints such as demand, materials, capacity, location, man-machine, and information requirements. It is a project oriented course that is basically a synthesis of the techniques and methodologies previously covered in other courses. Projects are implemented conforming relevant standards, ethical issues and environmental policies.
Pre-requisite: MANE490 & Co-requisite: MANE441, submission of MANE400 report

MANE444 Seminars on Manufacturing and Service Systems (2,0) 0
The purpose of this course is to introduce students to the work atmosphere and opportunities available in the manufacturing and service sectors in TRNC and Türkiye. Throughout this course, a series of seminars will be given by invited speakers on issues of current interest to the practice of industrial/management engineering in various manufacturing and service systems. Additionally, seminars about continuing education in mamagement engineering related fields, research opportunities at other universities, or subjects that will broaden the horizons of students may be presented.
Pre-requisite: In the last Spring semester before graduation.

Area Elective Courses

Area Elective courses are same for both programs.

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(ÖZAY ORAL Library)

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You may also download Handbook of Library from:
https://library.emu.edu.tr/en/help-guidance/library-handbook

The books which are most frequently used are kept in the Reserve Section.

GRADUATE PROGRAMS

Department of Industrial Engineering offers the following graduate programs:

- MS in IE (with Thesis): Completion of 7 credit-courses, Seminar and Thesis is required.
- MS in IE (non-Thesis): Completion of 10 credit-courses and Project is required.
- MS in Engineering Management: Completion of 10 credit-courses and a Project is required.
- PhD in IE: Completion of 7 credit-courses, Seminar, Qualifying Exam and Thesis is required.

For further details please refer to: **https://ie.emu.edu.tr/en**

For Rules and Regulations about Graduate Studies in EMU: **https://grad.emu.edu.tr/en**