ABET SELF-STUDY QUESTIONNAIRE: TEMPLATE FOR A SELF-STUDY REPORT

2017-2018 Review Cycle

ENGINEERINGACCREDITATION COMMISSION

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ABET
Self-Study Report

For

Mechanical Engineering Program

at

Mechanical Engineering Department

University of Technology

Baghdad, Iraq

Jul. 2018

to

Engineering Accreditation Commission
ABET, Inc.
111 Market Place, Suite 1050
Baltimore, MD 21202-4012

CONFIDENTIAL

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for
EAC of ABET
Accreditation or Reaccreditation
BACKGROUND INFORMATION

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B. Program History

About University of Technology:

The university started with steady scientific achievements. It was established in 1960 with the idea of establishing an Institute of Industrial Teachers, outlined by the Ministry of Education in cooperation with UNESCO, the founding of the Institute was declared on 22 January 1960, The course of studies was limited to five years after acquiring the high school graduate Certificate, in the subject of Engineering Applications, the first batch was accepted with 45 male students, all of whom were graduates of Industrial Secondary Schools. Since founding, the objectives of the Institute were identified by the need for Engineering Technologists, to work in the industrial sector, with emphasis on Engineering projects and Applications research labs, it was also charged with the task of preparing teachers to train professionals in the Industrial and Professional trades, aiming to solve the problems of availability of trainers and workers in those trades, and enabling specialists to manage departments and laboratories. The introduction of specialized learning sessions at the institute, was directed through recommendations and instructions of the Presiding Council of the Institute, and approved by the Ministry of Education. As founded the Institute included the following sections:

- Department of Materials Engineering
- Department of Mechanical Engineering
- Department of Automotive Engineering
- Department of Electrical Engineering
- Department of Building and Construction Engineering
- Department of Manufacturing Engineering and Assembly

The name of the institute was changed, a few months after its inception, to the Higher Institute of Industrial Engineering, then subsequently renamed after an order by the Ministry of Higher Education, due to its increased importance and to reflect its advancement, and in agreement with UNESCO in 1967, to The Higher College of Industrial Engineering and subsequently amended to the college of Engineering Technology, while simultaneously annexed to the University of Baghdad, Final disengagement of the Faculty from the University of Baghdad, was issued by The decision to establish the University of Technology on 1 April 1975, by a Presidential Decree.

About Mechanical Engineering Department:

The General Mechanical Engineering Program is an extension of the of Mechanics Department, which was founded with the emergence of the High Industrial Institute in 1960 with the help of the United Nations Educational, Scientific and Cultural Organization (UNESCO), and this Institute then turned to College of Technology Engineering in 1967, and attached to University of Baghdad until the establishment of the University of Technology in 1975, according to the system of the University of Technology, the department is equivalent to the deanery of collage in its administrative structure. The head of the department serves as Dean of the College and his assistants as dean ones and the heads of branches as the heads of departments in counterpart colleges as each branch of The Mechanical Engineer Department is equivalent to department in college at the other universities.

The department is the oldest and the largest scientific departments of the University of Technology which aims primarily to prepare practical engineers in different fields of mechanical engineering at the stage of undergraduate studies and to prepare of advanced cadres in different specifications in post-graduate studies for many graduates. The department also undertook responsibility of contributing in the preparation of moderate cadres that are needed by development plans and developing studies in various and rare fields of mechanical engineering .The department also contributes in the preparation of technical courses and works to send all its technical, administrative and teaching cadres, and to rise their technical, administrative and teaching abilities and levels in sectors of mechanical engineering.

Within the process of Equipment and machines Engineering Department, the educational and scientific process began to develop through the accumulation of experiences taking advantage of the administrative and scientific competencies that gained many of its skills from previous generations, which were keen to the department academically and administratively.

The study in the Department has the nature of application in addition to the theoretical lessons with higher engineering level where the department contains many specialized and acute laboratories; moreover the practical application in the training center and laboratories at the University of Technology for the Students of equipment and machines Engineering Department will continue during the various stages of the study and this is what qualifies the graduate to be good Technological engineer. The summer training in government directorates and public sector organizations is systematically considered lesson that many of engineering graduation projects for the ended phase is characterized by technological nature. The department takes the initiative to send top students out of the country for study, training and access to the latest technological developments.

The department contains a number of laboratories and engineering workshops to help graduate students in primary and high studies to achieve the practical part of their studies .These laboratories have been developed and updated in recent years in line with the scientific and technological development.

The department of Mechanical engineering at the University of Technology (UOT) gives bachelor's degree in the Engineering department sciences (B.Sc.) for mechanical engineering specializations (Mechanics Engineering, Air-conditioning and refrigeration engineering, Aircraft Engineering and Automotive Engineering) and the Master of Science degree (M.Sc.) for specializations of (heat capacity, applied mechanics, air conditioning and freezing) and a (Ph.D.) in mechanical engineering philosophy in both (Refractories and Applied Mechanics).

About General Mechanical Engineering Branch:

General Mechanical Engineering Branch was established during the year 1975.Since 1975 General Mechanical Engineering plays a major part in the production of all commodities encountered in daily life. It is concerned with the efficient use of materials and energy and in this way it contributes greatly to the development and conservation of the wealth of the country. This profession covers the fields of design and manufacture of power generation equipment and all types of machines. It is as much concerned with plants that process materials as with the machine tools that are used to shape them. The program specializes in graduation of applied engineers after four years of study in the jurisdiction of mechanical engineering where graduated students have familiarity and knowledge in related mechanical engineering.

The Bachelor of Engineering is a professional degree that allows graduates of the program to register in the Iraqi Engineers Association and practice the profession directly after graduation. The four-year program included one years' study common to the major, covering basic science and engineering topics courses besides the general education topics, and then three years of

specialization in mechanical Engineering. The curriculum was also developed to satisfy the Iraqi requirements for licensure.

It contributes to faculty members in the branch to submit their research for publication in scientific journals and participation in local and international conferences on topics of applied mechanical engineering science

C. Options

The ME program grants only one degree, the Bachelor of Science in Mechanical Engineering (BSME).

D. Organizational Structure

Administrative structure from lower to upper administration:
Chair (General mechanical Engineering Branch), Dean (Mechanical Engineering Department, Chancellor (University of Technology).

E. Program Delivery Modes

The program is comprised of on-campus, traditional lecture/laboratory courses. Almost all courses are delivered in the classroom or laboratory with the exception of two: (1) the Professional Experience course in which students are required to work during the summer of the fourth year at a company that offers professional engineering practice in their field of specialization. The work period covers a minimum of four weeks of full-time work, and (2) the Project courses where students are required to work independently, under the supervision of a faculty member in the program, on a final year project in their field of specialization.
Web based applications, locally developed applications, are used by faculty members to supplement their courses by posting course related material on the Web. However, no distance education component is available in the program.

F. Program Locations

The program is completely offered in the main UOT campus in Baghdad.

G. Deficiencies, Weaknesses or Concerns from Previous Evaluation(s) and the Actions Taken to Address Them

This will be the first evaluation by an ABET evaluation team.

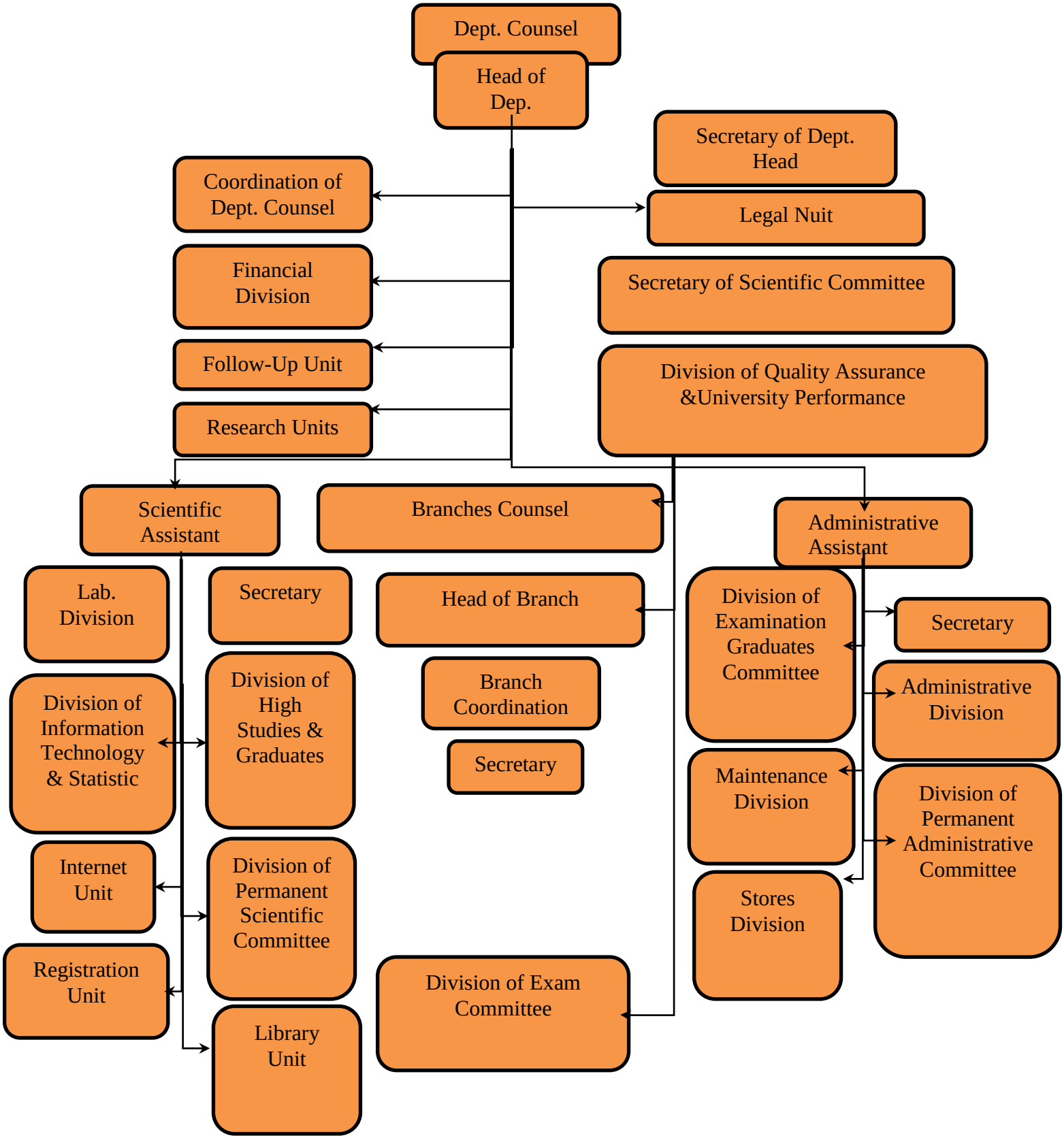
H. Joint Accreditation

The program is not accredited by any commission.

Organizational Structure

The organization charts for Mechanical Engineering Department are shown on the following pages.

Organizational Structure



CRITERION 1. STUDENTS

A. Student Admissions

To be accepted for an undergraduate degree in Mechanical Engineering, applicants must hold the official Iraqi Secondary School Certificate, Ministry of Education.

The Ministry of higher Education and Scientific Research controls and distributes electronically the admissions of students in the governmental institutions and faculties according to their grades from the Secondary Schools, and these are some of the most important requirements for controlling the accepting of students:

A- To be Iraqi nationality and born on 1994 and up.

B- Have a certificate from an Iraqi secondary school authorized from the ministry of education.

C- Have a medical certificate to ensure that he is qualified.

D- Be a full-time study.

E- Not to be acceptable and continues to study in another college.

F- Non-Iraqi students (arrivals) who obtained a certificate of an Iraqi secondary school admitted according to the central acceptance.

G- Admission 10% of the top graduates of technical institutes.

H- Acceptance of talented student.

2- When student or applicant was admitted in UOT / in the appropriate department according to his grades, then the department will also distribute and register him in the scientific branches of department with priority according to:

- His grades.
- His wish to register in the suitable branch.

3- The above mentioned sequence is documented and must be followed by written rules in which a special committee is formed and consists of some experienced academic staff with head of registration division in the department to perform the admission and distribution of new students in the appropriate branch. Table (1.1) shows the number and rate of students admitted in the Department of Mechanical Engineering for the past five years.

Table (1.1) numbers and rates of accepted students for the five years ago.

School year	Acceptance rate		New students No.	Graduates No.
	Minimum average	Moderate average		
2017-2018	84	91	43	54
2016-2017	85.7	92.14	30	42
2015-2016	89.4	93.4	42	47
2014-2015	89	91	41	47
2013-2014	86.71	87.92	44	45

B. *Evaluating Student Performance*

The Evaluation process and assessment measures are as follows:

Subject with lab.	Midterm10% + 5% continuous evaluation	Second Midterm 10% + 5% continuous evaluation	10% lab. evaluation	Final Exam 60%	Final Grade 100%
Subject without lab.	Midterm10% + 5% continuous evaluation	Second Midterm 10% + 5% continuous evaluation	N/A	Final Exam 70%	Final Grade 100%
Engineering Drawing & Descriptive Engineering	25% Engineering drawing (practical &evaluation)	10%Description Engineering Midterm	15% CAD lab.	Final Exam 50%	Final Grade 100%
Project	Discussion 10% + 10% evaluation	30% evaluation	N/A	Discussion 30% + 20% project report	Final Grade 100%

Evaluation of student performance in each subject by a faculty member. This assessment is different and graded according to the type of material, subject, tasks, and duties and to answer questions. These tasks and duties are usually a combination of tests, exams. Homework and laboratory reports, projects or oral presentations of some of the topics. Moreover, on each student to submit a written report for the final graduation project.

It is followed up by the student evaluation of faculty members and through the examination committee, and turn into a final evaluation through final grades at the end of the school year. In addition, it is verified and the results of student assessment and to ensure the validity and eligibility and place it after the academic assessment. Note that the lowest rate is permitted to cross the student is an advanced stage (50%).

As well as (through the non-attendance committee) on a regular basis and follow-up curriculum and vocabulary study and absorbed well and are not repeated absences so as not to exceed the stated percentage allowed (10% of the total number of hours during the year) is the follow-up students' commitment to come to the classroom.

Students who were not able to attend the relevant final examination or fulfill some of the course requirements because of conditions beyond their control are allowed to take a second attempt exam. In addition, Students who were not able to attend the relevant second attempt examination because of conditions beyond their control (due to security and violence issues) are allowed to take a third attempt exam. If the student fails to get 50% final grade after the third attempt, he/she will be excluded and the general registration office will close his file as student.

C. Transfer Students and Transfer Courses

Transfer student from one department to another in the same discipline. In case of a difference in some subjects matched for subject's analogy. Were for non-analogues being clearing to see what subject the most similarity in the department or choose a subject with a similar curriculum, as well as taking into consideration equal to the units in order to graduate student an investigator full units.

An applicant who has studied at a recognized institution of higher education may apply for admission as a transfer student. A transfer applicant will not be considered for admission if he or she is on academic probation, suspension, or dismissal from the previous institution. The transfer students' conditions are the followings:

1. The Chancellor of the University has the authority to transfer students (either those who pass or not pass the final exams) except the first and last year students to the corresponding departments and branches in another university according to capacity after obtaining clearance from the original and new university.
2. Students who pass final exams have the right to move to the corresponding colleges, departments, and branches in universities at their geographic regions according to the absorptive capacity after obtaining no objection from the original and new university.
3. Movement between colleges at the same governorate is not allowed.
4. Conduct scientific clearing in according to the applicable roles.
5. The departments of UOT represent colleges, and the transfer between them is central and according to an electronic form.
6. Sons and daughters of scientific titles of the faculty have the right to move between the branches of the colleges.
7. Students in community (private) colleges who are pass the final exams with first grade, and at least have a (very good) grade, have the right to move to the corresponding department in the public universities.
8. Acceptance of foreign students (Iraqi and non-Iraqi) from outside Iraq must be performed by the Ministry of Higher Education and Scientific Researches roles.

For more information visit the link (http://www.dirasat-gate.org)

D. Advising and Career Guidance

1- Hold a meeting of mentors and faculty member's respective personnel the guidance on how to provide a safe environment for students, and contribute to modify their behavior.
2- Hold a seminar for students in the early grades to familiarize them with the functions of the educational guidance and how to deal with the problems they may face and be educated on how to deal with members of the body and the style of problem-solving manner correctly.
3- Develop educational and professional releases that contribute to the benefit of students in the school and the various aspects of life.
4- Held several meetings for mentors for students in grades second, third, and fourth, respectively, to discuss various educational and behavioral aspects of interest to students.
5- Participate in seminars held by the events section.
6- Participate in field trips for students in the department.

7- Dealing with different students and boards of control and the issues of sanctions taken against some students.
8- Host students with scholarships problems, or the slaw ownership, and help them solve it.

Advice, support and clarifications are being provided for students by the faculty members in the Mechanical engineering Department / General Mechanical Engineering Branch. Table (1-2) shows the percentage of faculty members and their qualifications for the total number of students in the department of Mechanical engineering / General Mechanical Engineering Branch during the academic year (2017-2018).

Table (1.2) shows the percentage of faculty members and their qualifications for the total number of students for the academic year 2017-2018

	Faculty Member						**Total**
	certification		**Scientific title**				
	Master	**Doctoral**	**Professor**	**Assistant Prof**	**Lecturer**	**Assistant lecturer**	
	5	16	2	6	9	4	21
Relative to **(54)**students of (2017-2018)	9.2%	29.6%	3.7%	11.11%	16.6%	7.4%	38.8%

E. Work in Lieu of Courses.

N/A

F. Graduation Requirements

Getting degree of Bachelor of Science in Mechanical Engineering program, the student must adhere to the following requirements:
1. Succeeding in the four years of study and the maximum period allowed for the study (6years) (according to year of acceptance, effective regulations and instructions related to student)
2. Passing the summer training successfully.
3. Success and acceptance of the graduation project.

The Registration Division in the Department retains with a full file of the academic program, graduation records and application of each student. This file contains all academic records, correspondences, documents related to the student including the following:

a. A completed and updated copy of the results of the students at the end of each academic year.

b. A detailed review of the curriculum which shows the themes and required categories in detail: Math, Science, Humanities, Engineering Science, and other specialized topics.
c. Copies of all academic correspondence with student, including letters of acceptance in the university.
d. Any exceptions of the rules made by the student and taking any action on those exceptions.
e. Any comment or instructions by the head of the department or assistants including members of the faculty or any other relevant sources.
f. Medical reports and the behavior of the student such as cheating in the exams.
g. Failure documents and returning back to school seats and delay.

Students with the help of their advisors fill out an individual contract sheet that maps the track of courses they need to take in order to graduate. These sheets are updated at the end of each semester when the grades of the courses come out. When students have successfully earned a total of 124 credit hours, advisors report to the faculty the status of their students regarding graduation.

Table (1.3) Classes and Units Requirements for Graduation

School stage		Lessons no.	Units no.	No. of hours/week			
				practical	applicable	Theoretical	Total
First		9	23	4	13	13	30
second	Mechanics	9	42	4	8	17	29
Third	Mechanics	9	41	5	7	17	29
Fourth	Mechanics	9	40	5	10	15	30

G. Transcripts of Recent Graduates

Transcripts of recent graduates will be provided to Team Chair when requested.

CRITERION 2. PROGRAM EDUCATIONAL OBJECTIVES

A. Mission

Mission Statement of the University of Technology:

The mission of the university of technology is prepare technically oriented engineers and scientific researches, distinguished in their high standards of knowledge and intellectual ability that comply with the international sound criteria of accreditation and quality assurance for the engineering and scientific programs and full commitments of the professional ethics.

Mission Statement of the Mechanical Engineering Department:

Prepare specialists in the field of mechanical engineering on a distinct level of knowledge and keep abreast of developments in the rapid development in this field and a commitment to professional ethics in work and society field.

Mission Statement of the General Mechanical Engineering Branch:

The mission of the general mechanical engineering branch is to prepare engineers who had bachelor's degree in mechanical engineering sciences \ general according to society's need and keep going with technical and scientific, through upgrading teaching staff, laboratories, libraries and curriculum. Developing study quantitatively and qualitatively in accordance with the main objectives of the university which is represented by reproducing of new channels and paths in the undergraduate and postgraduate studies in line with recent technological developments so that the disciplines and research can be conformed with the scientific development and the requirements of the labor market depending on the successive discoveries and rapid progress of science and technology in all fields of contemporary human life and activities.

B. Program Educational Objectives

The general mechanical engineering branch programs have strategic objectives are represented by:

Objective 1: Preparing engineers in mechanical engineering / general mechanics, is their construction and reconstruction and to participate mechanical engineering profession in line with the country's need to re-renaissance, as well as preparing educated generation armed with scientific knowledge, probity, profession ethics and method in thinking and analysis.

Objective 2: Working on deepening the balance between the progress of science and the theoretical and practical aspects of them, as well as a focusing on introducing modern methods in the learning system that increase the students' ability to design, creativity and innovation.

Objective 3: Paying more attention to the student in various aspects because they are the product of the education program, the department and the university community and the fundamental article of sustainable development through directing them to choose the best means to expand their activities and deepen their professional and scientific specialties within the plan of sustainable development.

C. Consistency of the Program Educational Objectives with the Mission of the Institution

The program educational objectives of the general mechanical engineering branch are consistent with the mission of the institution. To summarize this mapping between program educational objectives and the mission statements:

1- Program Educational Objectives 1 and 2 are consistent with the mission of meeting high standards of student success by providing access to a learner-centered, high quality educational program.

2- Program Educational Objective 3 is consistent with the mission of producing graduates that are prepared for advanced education and life-long learning and therefore capable of engaging in the process of research and scientific discovery for the benefit of local, regional and global communities.

D. Program Constituencies

The main constituencies of the Industrial Engineering program are:

- Students
- Faculty
- Staff
- Alumni
- Employers
- Program Advisory Board

The constituencies and their relationships to the program are described below:

1) Students: Students have a clear interest in having a broad knowledge of the program related principles, tools, and theories as this prepares them for related careers, and helps them secure jobs locally and abroad. The importance of student engagement is reiterated in student forums discussions, the course surveys and the alumni surveys.

2) Division members: Division members strive toward graduating students who are technically capable; have an understanding of the ethical and social dimensions in the program; capable of life-long learning, and who can work in teams. Such traits would elevate the program status and improve its reputation locally, regionally, and internationally. The Division works with course coordinators in order to review courses and ensure that they are aligned with the program outcomes, which in turn contribute to the program's objectives.

3) Staff members: The program receives support at the Division, Departmental and University levels. The personnel provide administrative and technical support. Their tasks include overseeing the up keeping of department, academic, financial, and documents, arranging and sending calls on behalf of the chair for departmental meetings, data collection process for evaluation activities. They also maintain updated student records, personnel, alumni data, and work closely with the Registrar’s office to coordinate all program related matters, as well as administering training/internship opportunities for the potential students.

4) Alumni: Alumni are clearly influenced by the Department's reputation, as this would help them advance their careers. They frequently contact faculty for recruitment purposes.

Finally, the Department regularly surveys alumni in order to confirm that the objectives are in line with current trends.

5) Employers: Employers or industry partners have indicated that they have a clear interest in having students prepared upon entering the workforce. Clearly, the technical and personal preparation of the students is instrumental. Employers are also surveyed to get their feedback and ideas on the state of our graduates and the relevancy of the program's outcomes and objectives.

6) Program Advisory Board:

The Mechanical Engineering department has an Industrial Advisory Council (IAC). The IAC, which is currently composed of 18 industry leaders from various sectors in the field of Engineering, meets twice a year and have played an important role on curriculum changes and continuous improvement of the General Mechanical Engineering Branch Program based on the current and future needs of industry. The fall meeting features an Undergraduate Forum, where the council members address and discuss important engineering issues with the students. At the spring meeting the primary role of the council is to evaluate and critique the Capstone Design Presentations. The Council is an objective body within General Mechanical Engineering Branch that ensures the department's continuous commitment to anticipate and surpass new academic challenges set forth by an evolving industry. The board experts and the meeting record of industrial competencies council are attached hereto in the next pages.

University of Technology **No.: 5 H M K / 0256**

Mechanical Engineering Department **Date: 7 / 6 / 2016**

Administrative order
Setting up of Industrial Competencies Council

Referring to the sidelines of the esteemed Mr. President of the university dated 18/5/2016 on the letter of Electromechanical Engineering Department and for the purposes concern with of reliability processes (**ABET**), it was decided to form a Council from the industrial competencies in the Department of Mechanical Engineering, according to the scientific branches as follows:

No.	Job Title	Full Name	Workplace	Scientific Branch
1	Senior Chief Engineer	Majed Nader Abed Alkader	Ministry of Electricity - General Directorate for Electro Power Production - Central Region	General Mechanical
2	Senior Engineer	Emad Khanim Nagi	Ministry of Oil - Oil Pipeline Company - Al- Karkh Warehouse	General Mechanical
3	Engineer	Nader Rasheed Saaid	Commercial Director of Al-Tamimi Engineering Group - Private sector	General Mechanical
4	Professor Dr. Engineer	Qasim Salih Mahdi	College of Engineering – University of Al-Mstansirya	Airconditioning and Refrigeration
5	Lecturer / Engineer	Abed Alkarim Salman Abed Alkarim	Universal Al-Esrah College	Airconditioning and Refrigeration
6	Engineer	Ali Zuhir Ali	Hexa Corp Carrier Company	Airconditioning and Refrigeration
7	Engineer	Basim Mahdi Jaffer	Iraqi Airways	Aircrafts
	Engineer	Raaid Salman Aliwi	Iraqi Airways	Aircrafts
9	Engineer	Ihsan Ezet Salih	Iraqi Airways	Aircrafts
10	Military Dean Engineer	Sabah Adem Mahmoud	Air Force Leadership - Director of Air Engineering	Aircrafts
11	Dr. Engineer	Raouf Mohamed Radie Almosawi	General Company for Automotive and Equipment Manufacturing - Alexandria	Automotive

12	Engineer	Adnan Ahmed Razin	General Director of the General Company for Automotive and Equipment Manufacturing - Alexandria	Automotive
13	Engineer	Hassan Saad Abu Naylah	Veritas Limited Company for Automotive Trading and Services - Agent of Doudg, Jeep and Chrysler Company in Iraq	Automotive
14	Chief Engineer	Dr. Raad Abed Mahdi	Ministry of Electricity - Planning and Studies Department	Power Plants
15	Chief Engineer	Lamaan Sabri Majly	Directorate of Electricity Production - Central Region	Power Plants
16	Chief Engineer	Alaa Abed Aljebar Bedin	Ministry of Electricity - Training and Energy Researches Department	Power Plants
17	Consultant Engineer	Adel Bader Alryahi	Ministry of Planning – Bureau of Ministry Deputy	Power Plants
18	Engineer	Mazin Khadim Mohamed	Al-Kudis Thermal Generating Station	Power Plants

Dr. Moyed Razoki Hasan

Head of Mechanical Engineering Department

A copy to:

- Bureau of Mr. President of the University Esquire / for your kind review with thanks.
- Bureau of President Assistant of the University for Scientific Affairs and Higher Studies / For your kind review … with appreciation.
- Electromechanical Engineering Department / for your kind review and your letter above … with appreciation.
- Department of Quality Assurance and University Performance / for your kind review … with appreciation.
- Bureau of Head of Department / Reliability file.
- Mr. Scientific Assistant Esquire.
- Mr. Administrative Assistant Esquire.
- Misters Heads of Branches Esquire – your memorandum in particular … with appreciation.
- Section of Quality Assurance and Scientific Performance … with appreciation.
- Issued letter file.

University of Technology First Meeting on 22/6/2016
Department of Mechanical Engineering

Meeting Record of Industrial Competencies Council
First session

Referring to the workshops achieved by the Department of Quality Assurance and University Performance and that indicated the necessity to form an Industrial Competencies Council and hold a periodical meeting for the council for at least two sessions a year, and referring to the administrative order no. h m k / 1256 on 7/6/2016 included forming of Industrial Competencies Council (attached hereto), a meeting was held in the presence of members of the Mechanical Engineering Department and members of the Industrial Competencies Council with hosting the responsible of Quality Assurance and University Performance Section in the department on Wednesday 22/6/2016, and included the following items:

1) Mr. Head of department welcomed the attendants in the Department of Mechanical Engineering place presenting them the thanks and appreciation for accepting the invitation in the days of Ramadan month, wishing all acceptable fasting. Then, he turned to the ambition of University of Technology for entering the reliability by meeting the requirements of **ABET,** where he referred to the existence of a department concerns with the quality, known as Quality Assurance and University Performance, and from this department, a special section for quality assurance and university performance emerges in each department of the University of Technology. And for the purpose of achieving these requirements, a correlation between the theoretical output in the department and the industrial sector should be performed, for which this council is emerged.

2) The responsible of Quality Assurance and University Performance Section displayed the extracted data from the work of the section for all department branches, represented by the General Mechanical Engineering Branch, Air-conditioning and Refrigeration Engineering Branch, Automotive Engineering Branch, Aircrafts Engineering Branch and Power Plants Engineering Branch. He also exhibited through them the objectives of each scientific branch and the desire to shortcut these goals and refine them in line with the requirements of **ABET,** referring to the University of Missouri's experiment in this area.

3) In light of the displayed data, a discussion has been opened on the subject with the participation of all attendants.

4) The discussion outcome viewpoints distributed between the academic side and the industrial sector which pointed out clearly the importance of formation of this council

being considered as a link between the educational and industrial sectors, and because it has a positive impact in giving the moral momentum to dear students.

5) Most of the attendants expressed their willingness to provide support to achieve the goals of scientific branches through their readiness to submit projects that include real industrial problems to study them as graduation projects for the fourth stage as a first step with the importance of organizing scientific trips to the industrial sector enhancing the student's self-confidence and his knowledge by application.

6) Forms were distributed to the members of the council and the required information were fixed in the form such that the communication should be done through the websites for the success of this experiment, which is considered by many of them a successful step that needs more support and cooperation to consolidate it.

7) Mr. Head of department presented on behalf of the department council, the employees of the department and the presidency of the University of Technology the thanks and appreciation to all attendants, wishing them continual progress and prosperity.

Dr. Wafa Abed Sauod

Coordinator of
Department Council

Dr. Moyed Razoki Hasan

Head of
Mechanical Engineering Department

E. Process for Review of the Program Educational Objectives

The Program Educational Objectives:
(PEOs) have been reviewed and updated by the following steps.

1. The PEOs are reviewed and revised as necessary by the faculty at the beginning of fall semester (every year).

2. The PEOs are reviewed by the MAE Industrial Advisory Council at their fall meeting (every study course).

3. The PEOs are reviewed by students, alumni & employers for their input (every third year).
4. The MAE Undergraduate Committee analyzes the constituent feedback and assessment results during summer, and then recommends any changes on the PEOs, if necessary, to the faculty (every year).
5. Back to the step 1 for an annual review process. In a summary, the Program Educational Objectives (PEOs) are reviewed annually by the faculty and MAE-IAC along with the annual assessment of Student Outcomes. The feedback for the PEOs is also sought from the alumni and employers along with the assessment and the PEOs is also sought from the alumni and employers along with the assessment and evaluation of the PEOs every three years. Therefore, the PEOs are fully reviewed and evaluated on a three-year cycle.

The general mechanical engineering Program Educational Objectives have been reviewed according to the need of labor market and rapid technology development in mechanical engineering to match the mission of the program.
These objectives have been reviewed by the advisory Industrial Board of the department who agreed to change to the following:
1. Successfully practice the mechanical engineering disciplines;
2. Contribute to society and the profession;
3. Engage in life- long learning to advance professionally through continuing education and training;
4. Succeed in graduate studies in mechanical engineering or a related field if pursued.

CRITERION 3. STUDENT OUTCOMES

A. *Student Outcomes*

Students from the Mechanical Engineering program will attain (by the time of graduation):

a. an ability to apply knowledge of engineering, science, and mathematics (including multivariate calculus and differential equations);
b. an ability to design and conduct experiments, as well as to analyze and interpret data;
c. an ability to design thermal, fluid, and mechanical systems, components, or processes to meet Desired needs within realistic constraints;
d. an ability to function on multi-disciplinary teams;
e. an ability to identify, formulate, and solve mechanical engineering problems;
f. an understanding of professional and ethical responsibility;
g. an ability to communicate effectively in oral and written forms;
h. the broad education necessary to understand the impact of engineering solutions in a global, Economic, environmental, and societal context;
i. a recognition of the need for, and an ability to engage in life- long learning;
j. a knowledge of contemporary issues in mechanical engineering;
k. an ability to use the techniques, skills, and modern engineering tools necessary for engineering practice.

B. *Relationship of Student Outcomes to Program Educational Objectives*

The achievement of the Student Outcomes ensures that our graduates are well equipped to achieve the Program Educational Objectives in actual practice following graduation. The linkage between the individual Program Educational Objective (PEOs) and the Student Outcomes (SOs) is shown below in Table (3-1) and their relationships are briefly described as follows:

The educational objectives of the undergraduate program in general mechanical engineering branch to produce graduates who (within a few years of graduation):

1. Successfully practice the mechanical engineering disciplines;

2. Contribute to society and the profession;

3. Engage in life- long learning to advance professionally through continuing education and training;

4. Succeed in graduate studies in mechanical engineering or a related field if pursued.

PEO #1 states the successful practice as a mechanical engineer. Achievement of the Student Outcomes a, b, c, d, e, g and k ensures that our graduates are adequately equipped with the minimum level of knowledge and skills required for the practice.

PEO #2 emphasizes the service and responsibility as an engineer. Achievement of the Student Outcomes f, h and j will equip our graduates with the required ability.

PEO #3 stresses the need for life- long learning throughout their career. Achievement of the Student Outcomes a, h, i and j will ensure the required ability.

PEO #4 states that our graduates will be successful in the graduate study and the achievement of the Student Outcomes a-k makes the base for the success.

To assure that our graduates have achieved the Student Outcomes, the curriculum must contribute for achievement of each Student Outcome collectively. As all the Student Outcomes are addressed within the core curriculum, students of the General Mechanical Engineering Branch Program will be trained to achieve the Student Outcomes throughout the coursework. The ABET syllabi for the required courses are contained in the Appendix A. Each syllabus describes a weighted correlation of the course to the Student Outcomes as presented in Table (3-2).

Table (3-1) Mapping of Program Educational Objectives to Student Outcomes

PEOs	**Student Outcomes (SOs)**										
	a	**b**	**c**	**d**	**e**	**f**	**g**	**h**	**i**	**j**	**k**
PEO #1	**X**	**X**	**X**	**X**	**X**		**X**				**X**
PEO #2						**X**		**X**		**X**	
PEO #3	**X**							**X**	**X**	**X**	
PEO #4	**X**	**X**	**X**	**X**	**X**	**X**	**X**	**X**	**X**	**X**	**X**

Table (3-2) Contribution of Required Courses to Student Outcomes

Curriculum		(standards of the Accreditation Board for Engineering and Technology (ABET)										
First Class (FIRST COURSE)												
Code	**Name**	**a**	**b**	**c**	**d**	**e**	**f**	**g**	**h**	**i**	**j**	**k**
ME/111	Human Rights & Democracy						•					
ME/122	Programming I			•		•						•
ME/123	Mathematics I	•				•						
ME/134	Eng. Drawing &Descriptive											•
ME/145	WorkshopsI				•		•					
ME/136	Thermodynamics I	•	•			•						
ME/137	Mechanics I	•	•			•						
First Class (SECOND COURSE)												
ME100	English Language											
ME/139	Electrical Engineering	•	•			•						
ME/123	Mathematics II	•				•						
ME/138	Properties of Material			•		•						
ME/145	Workshops II				•		•					
ME/136	Thermodynamics II	•	•			•						
ME/137	Mechanics II	•	•			•						
ME/134	Engineering Drawing											•
Second Class(FIRST COURSE)												
ME/223	Mathematics III	•				•						
ME/234	Mechanical DrawingII			•								•
ME/245	Strength of Materials	•	•	•								
ME/236	Thermodynamics III	•	•			•						
ME/237	Mechanics III	•	•									
ME/238	Manufacturing Processes		•			•	•				•	•
ME/249	Fluid Mechanics I	•	•			•						
Second Class(SECOND COURSE)												
ME/223	Engineering & Numerical Analysis	•	•			•						•
ME/245	Strength of Materials II	•	•	•								
ME/249	Fluid Mechanics II	•	•			•						
ME/236	Thermodynamics IV	•	•			•						
ME/251	Mechanical & Electronic Systems							•				•
ME/222	Programming II	•										
ME/237	Mechanics IV	•	•									
Third Class												
ME/321	Engineering & Numerical Analysis	•	•			•						•
ME/342	Theory of Machines	•	•	•	•	•		•				
ME/343	Machine Design I	•	•	•	•	•	•	•	•	•	•	•
ME/354	Internal Combustion Engine Parts Design	•	•		•	•		•		•		
ME/345	Heat Transfer	•	•	•		•				•		
ME/356	Fluid Mechanics II	•	•			•				•		

ME/357	**Production Engineering**		•	•	•		•	•	•	•	•	
ME/328	**Computer Added Design**			•	•	•		•				•
ME/319	**Industrial Engineering**	•	•		•	•	•	•	•		•	
Fourth Class												
ME/431	**Measurement**	•	•	•	•	•				•		
ME/432	**Automatic Control**	•	•			•						
ME/457	**Gas Dynamics**	•	•	•		•				•		
ME/456	**Air-condition**	•	•	•		•	•	•	•		•	
ME/429	**Computer Added Eng.**	•	•			•					•	•
ME/453	**Power Plants**	•	•			•				•		
ME/454	**Machine Design II**	•		•	•	•		•		•		
ME/455	**Mechanical Vibrations**	•	•	•	•	•				•		
ME/448	**Project**	•	•	•	•	•	•	•	•	•	•	•

CRITERION 4. CONTINUOUS IMPROVEMENT

The assessment and evaluation process of the general mechanical engineering branch program consists of two separate systems; one for the Program Educational Objectives (PEOs) and the other for Student Outcomes (SOs). The assessment and evaluation results are used for continuous improvement of the general mechanical engineering branch curriculum and also used to revise and update the PEOs and SOs as needed. It is noted that the general mechanical engineering branch faculty and Industrial Advisory Council (IAC) play an important role in the annual review and assessment process.

A. Program Educational Objectives

The most important basic duties and functions of the general mechanical engineering branch for continuous improvement of the educational program are:

Continuous improvement of the educational program in the general mechanical engineering branch be sustained through the Scientific Committee and specialized committees branching from it. Are listed or proposed revisions to the curriculum of the committees referred to corrective action and of all faculty members in the meetings of the General Authority after discussion, review, and approval.

Since the academic year (2008-2009) was the adoption of a comprehensive change of the items of the curriculum of the general mechanical engineering branch after evaluating general and comprehensive of the old curriculum and review, and give wider powers to faculty members to update the scientific curriculum and (15%) for each academic year.

The focus in our branch and periodically on continuous improvement, the section is always trying to improve the scientific and administrative process and overcome all difficulties and obstacles that hinder the tutorial. We are working on the analysis of the deficit and put the right solutions to achieve satisfactory results.

The following describes the steps implemented or are in the process of implementation:

1. Continuous comprehensive renovations in the curriculum of the branch and on an annual basis since the academic year 2008-2009.
2. Continuous development of faculty members of the branch through communication with modern information.
3. Encourage faculty members of the branch to get the highest scientific and administrative ranks.
4. Provide modern software specialized in aircraft engineering.
5. Increase in extra-curricular activities for students such as establishment of scientific conferences and symposia, sports and personal creations.

The general mechanical engineering branch program utilizes feedback from the alumni and employers of our graduates to assess achievement of the Program Educational Objectives (PEOs). Both of the alumni survey and the employer survey were conducted at the end of the year 2015-2016. The PEOs at the time of the 2015-2016 are listed below. The educational objectives of the undergraduate program in general mechanical engineering branch are to produce graduates who (during the first several years following graduation):

Objective 1: Preparing engineers in mechanical engineering / general mechanics, is their construction and reconstruction and to participate mechanical engineering profession in line with the country's need to re-renaissance, as well as preparing educated generation armed with scientific knowledge, probity, profession ethics and method in thinking and analysis.

Objective 2: Working on deepening the balance between the progress of science and the theoretical and practical aspects of them, as well as a focusing on introducing modern methods in the learning system that increase the students' ability to design, creativity and innovation.

Objective 3: Paying more attention to the student in various aspects because they are the product of the education program, the department and the university community and the fundamental article of sustainable development through directing them to choose the best means to expand their activities and deepen their professional and scientific specialties within the plan of sustainable development.

For the 2016-2017 alumni survey, alumni who graduated between 2011 and 2017 were contacted by meeting inside the department and they were requested to fill out the survey form and a total of 10 alumni responded. In the survey, the alumni were asked how competent they feel now on our PEOs (Ratings: 1 = strongly disagree, 2 = disagree, 3 = neutral, 4 = agree, 5 = strongly agree) based on the education and training they received from our undergraduate program. Many of them replied with 4 or 5 for each PEO. The survey results with the average scores for each PEO are shown in Figure (4.1).

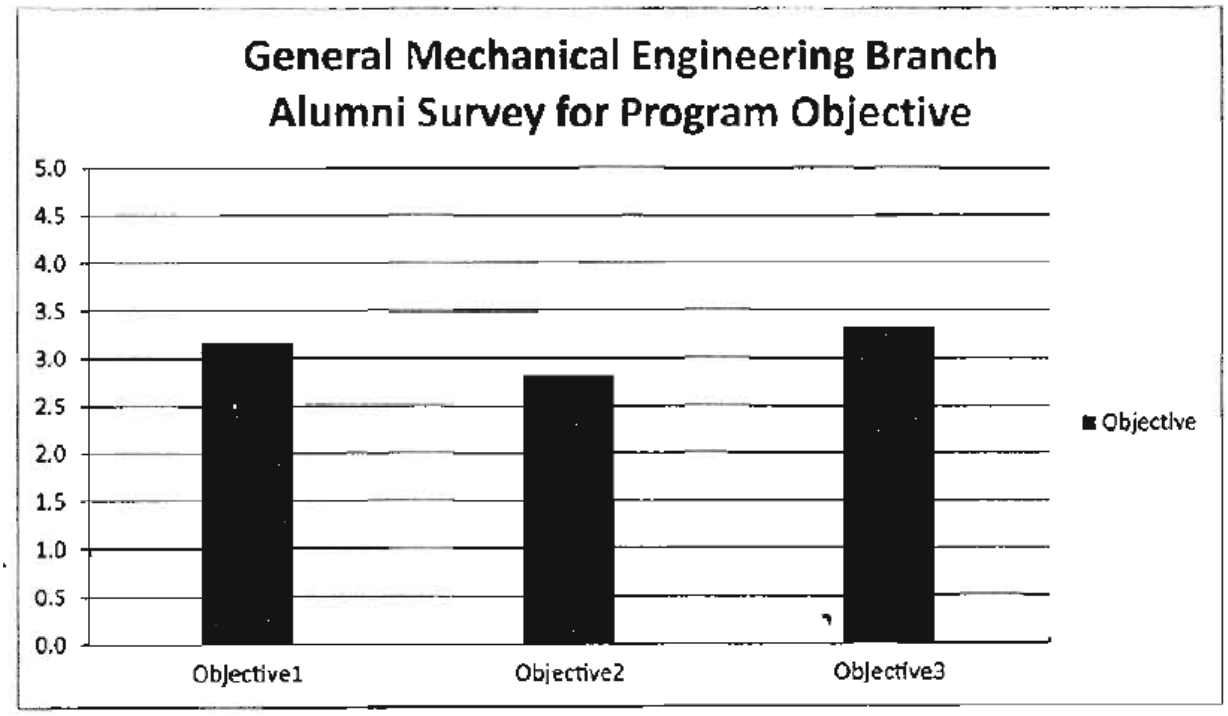


Fig. (4.1) Alumni survey for program Objectives.

The survey results were discussed at the general mechanical engineering branch faculty meetings during the May 2018. It was noted that the top two suggestions from our alumni for improvement of our program were "more real world experience" and "better communication skills". The faculty members will ask to consider more real world problems in their teaching materials in annual meeting September 2016. For the employer survey, approximately 9 employers responded. The employer survey consisted of two sections. In the section 1, the employers were asked to rate our PEOs (Ratings: 1 = strongly disagree, 2 = disagree, 3 = neutral, 4 = agree, 5 = strongly agree). Fig. (4.2) shows the results of the 2017-2018 survey with the average scores for each PEO. The results indicated that our graduates were comparable to the engineers from other schools.

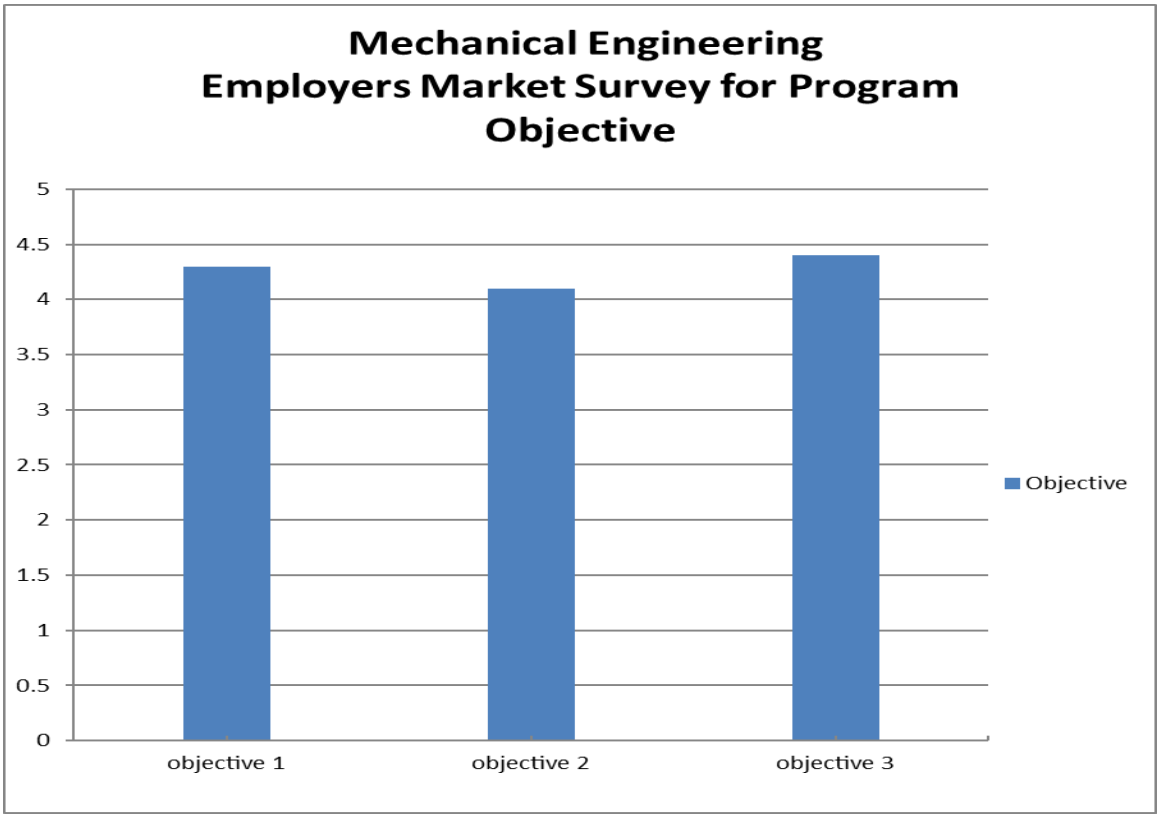


Fig. (4.2) Employers survey

Our PEOs were revised at the end of 2016-2017 PEOs by our constituents. The PEOs were assessed and evaluated through the alumni and employer surveys during the 2016-2017. The revised PEOs are listed below. The educational objectives of the undergraduate program in Mechanical Engineering are to produce graduates who (within a few years of graduation):

1. Successfully practice the general mechanical engineering disciplines;
2. Contribute to society and the profession;

3. Engage in life- long learning to advance professionally through continuing education and training;
4. Succeed in graduate studies in general mechanical engineering or a related field if pursued.

B. Student Outcomes

B.1. Assessment and Evaluation Process of the Student Outcomes

The assessment methods for the Student Outcomes (SOs) include Course Assessment and SOs surveys at the Exit Interview and Alumni. The assessment data collected during each academic year are analyzed during the following summer. The assessment results and actions for improvement are discussed at the beginning of the annually faculty meeting in September. The general mechanical engineering branch ABET Coordinator oversees all the assessment process while the general mechanical engineering branch Undergraduate Committee discuss the assessment results and recommend the possible actions for improvement to the general mechanical engineering branch faculty. The two assessment methods for the assessment and evaluation of Student Outcomes (SOs) are briefly described below.

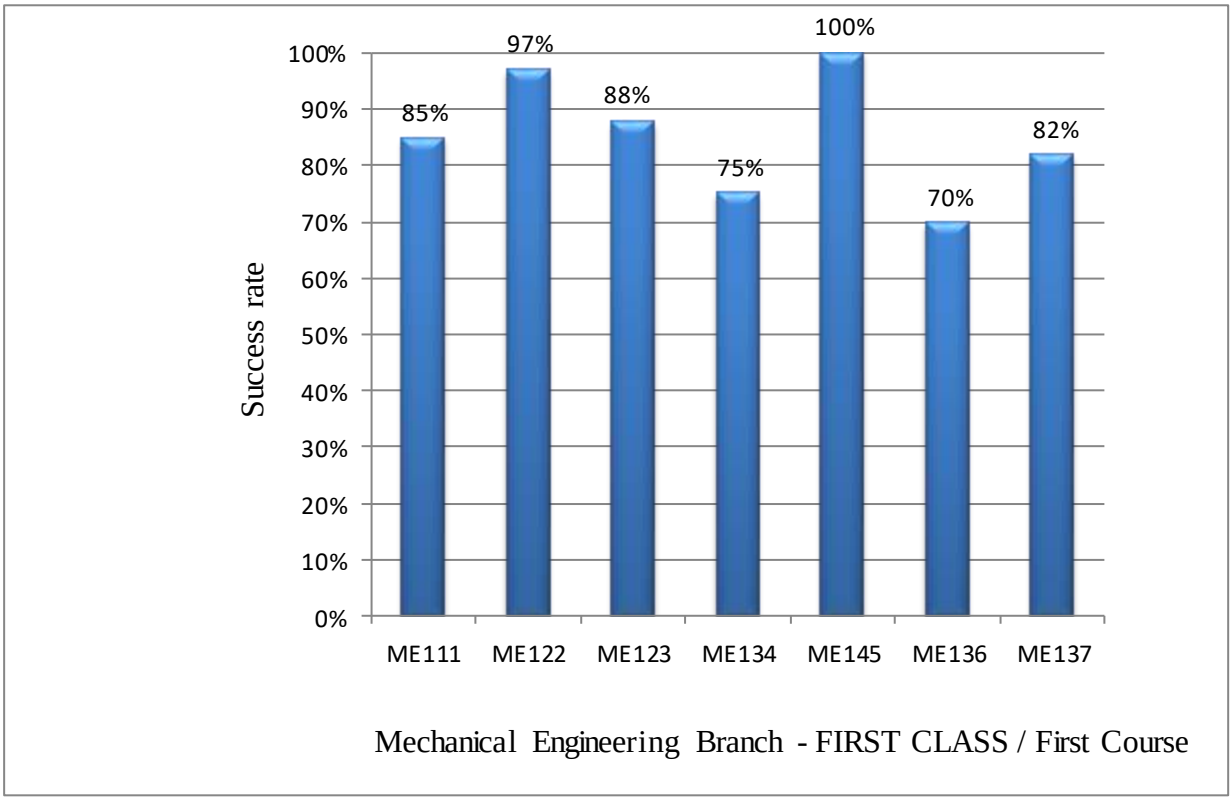
B.2. Course Assessment

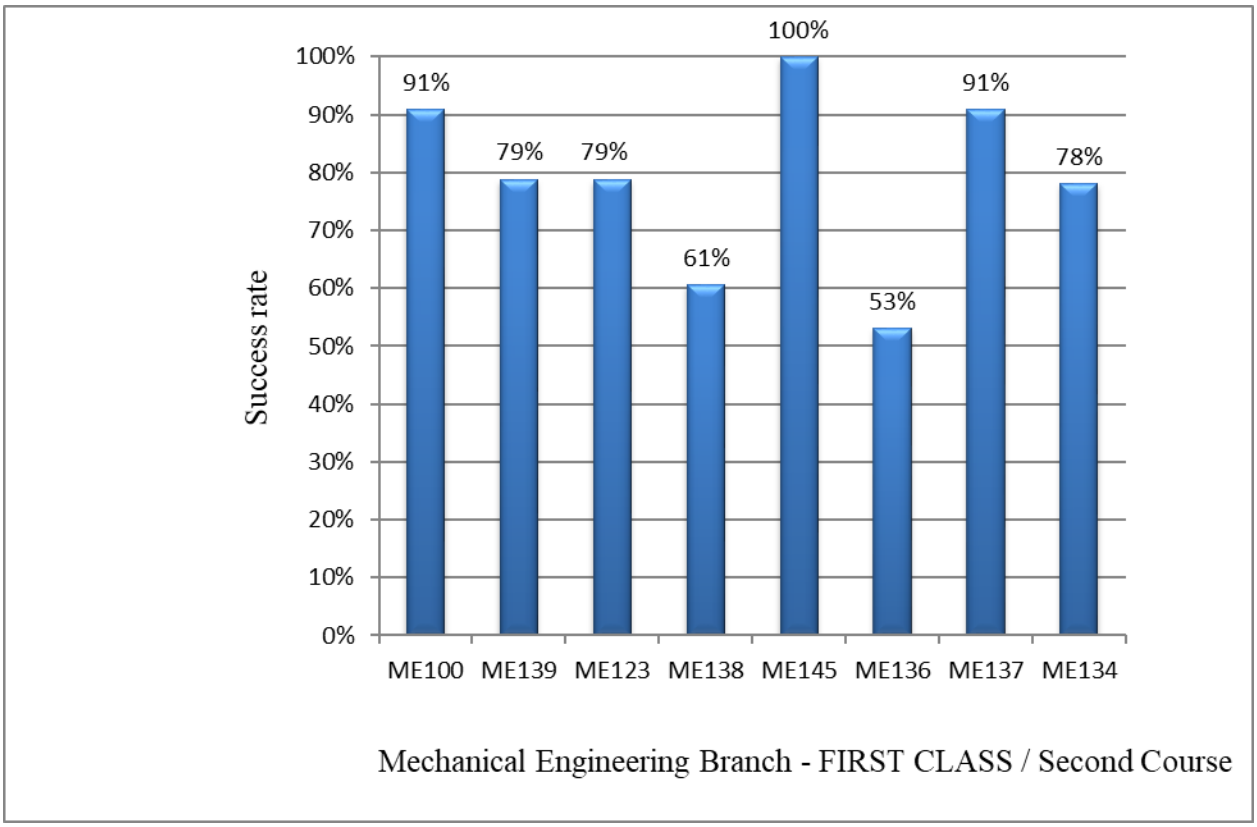
Table (4.1) illustrates which SOs are addressed by the required general mechanical engineering branch courses. The SOs are assessed through the assessment of the outcome-related from various courses collectively. Our primary goal is to distribute the coverage of each SO throughout the program so that our curriculum could provide repeated practice and feedback in the knowledge and skills the students need to achieve. To assure that our graduates have achieved the SOs, the curriculum must contribute for achievement of each SO collectively. As all the SOs are addressed within the core general mechanical engineering branch courses, our students will be trained to achieve the SOs. All courses average was passed 50%. In our system, the students have two attempts, one in June and the second in September. If they fail in first attempt, they have the right to have second attempt. Figure (4.3) shows the results of the two attempts for 2017-2018. Student work samples were collected as a part of the course assessment and they will be available for review.

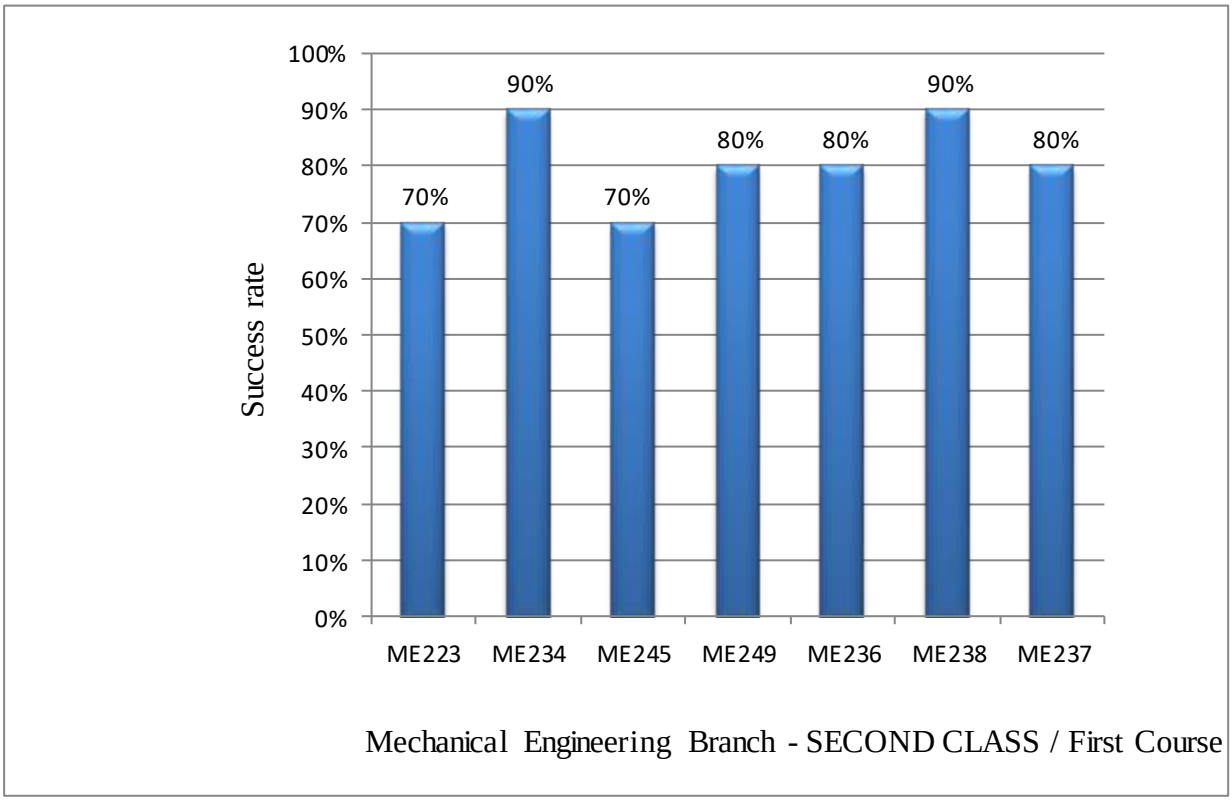
Table 4-1 Contribution of Required Courses to Student Outcomes

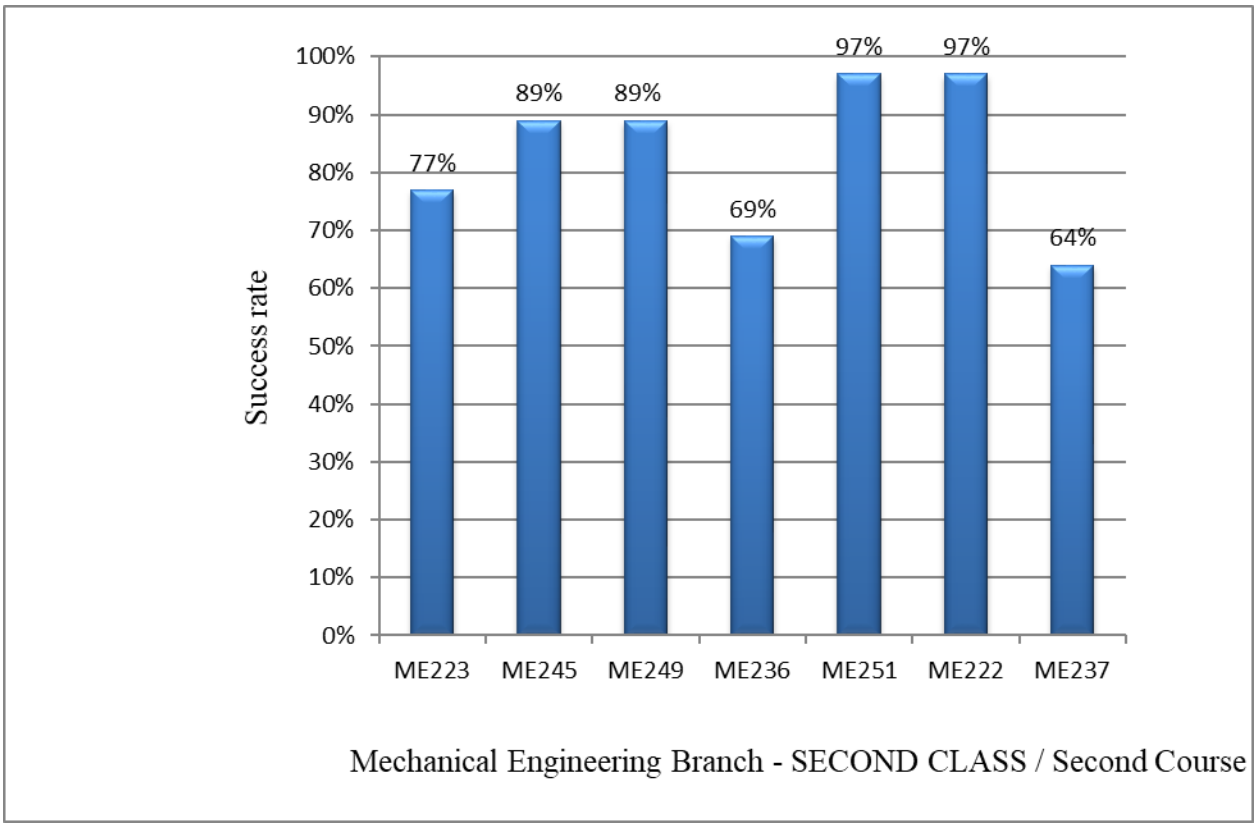
Curriculum		(standards of the Accreditation Board for Engineering and Technology (ABET)										
First Class (FIRST COURSE)												
Code	**Name**	**a**	**b**	**c**	**d**	**e**	**f**	**g**	**h**	**i**	**j**	**k**
ME/111	Human Rights & Democracy						•					
ME/122	Programming I			•		•						•
ME/123	Mathematics I	•				•						
ME/134	Eng. Drawing &Descriptive											•
ME/145	WorkshopsI				•		•					
ME/136	Thermodynamics I	•	•			•						
ME/137	Mechanics I	•	•			•						
First Class (SECOND COURSE)												
ME100	English Language											
ME/139	Electrical Engineering	•	•			•						
ME/123	Mathematics II	•				•						
ME/138	Properties of Material			•		•						
ME/145	Workshops II				•		•					
ME/136	Thermodynamics II	•	•			•						
ME/137	Mechanics II	•	•			•						
ME/134	Engineering Drawing											•
Second Class(FIRST COURSE)												
ME/223	Mathematics III	•				•						
ME/234	Mechanical DrawingII			•								•
ME/245	Strength of Materials	•	•	•								
ME/236	Thermodynamics III	•	•			•						
ME/237	Mechanics III	•	•									
ME/238	Manufacturing Processes		•			•	•				•	•
ME/249	Fluid Mechanics I	•	•			•						
Second Class(SECOND COURSE)												
ME/223	Engineering & Numerical Analysis	•	•			•						•
ME/245	Strength of Materials II	•	•	•								
ME/249	Fluid Mechanics II	•	•			•						
ME/236	Thermodynamics IV	•	•			•						
ME/251	Mechanical & Electronic Systems							•				•
ME/222	Programming II	•										
ME/237	Mechanics IV	•	•									
Third Class												
ME/321	Engineering & Numerical Analysis	•	•			•						•
ME/342	Theory of Machines	•	•	•	•	•		•				
ME/343	Machine Design I	•	•	•	•	•	•	•	•	•	•	•
ME/354	Internal Combustion Engine Parts Design	•	•		•	•		•		•		
ME/345	Heat Transfer	•	•	•		•				•		
ME/356	Fluid Mechanics II	•	•			•				•		
ME/357	Production Engineering		•	•	•		•	•	•	•	•	
ME/328	Computer Added Design			•	•	•		•				•

ME/319	**Industrial Engineering**	•	•		•	•	•	•	•		•	
Fourth Class												
ME/431	**Measurement**	•	•	•	•	•				•		
ME/432	**Automatic Control**	•	•			•						
ME/457	**Gas Dynamics**	•	•	•		•				•		
ME/456	**Air-condition**	•	•	•		•	•	•	•		•	
ME/429	**Computer Added Eng.**	•	•			•					•	•
ME/453	**Power Plants**	•	•			•				•		
ME/454	**Machine Design II**	•		•	•	•		•		•		
ME/455	**Mechanical Vibrations**	•	•	•	•	•				•		
ME/448	**Project**	•	•	•	•	•	•	•	•	•	•	•

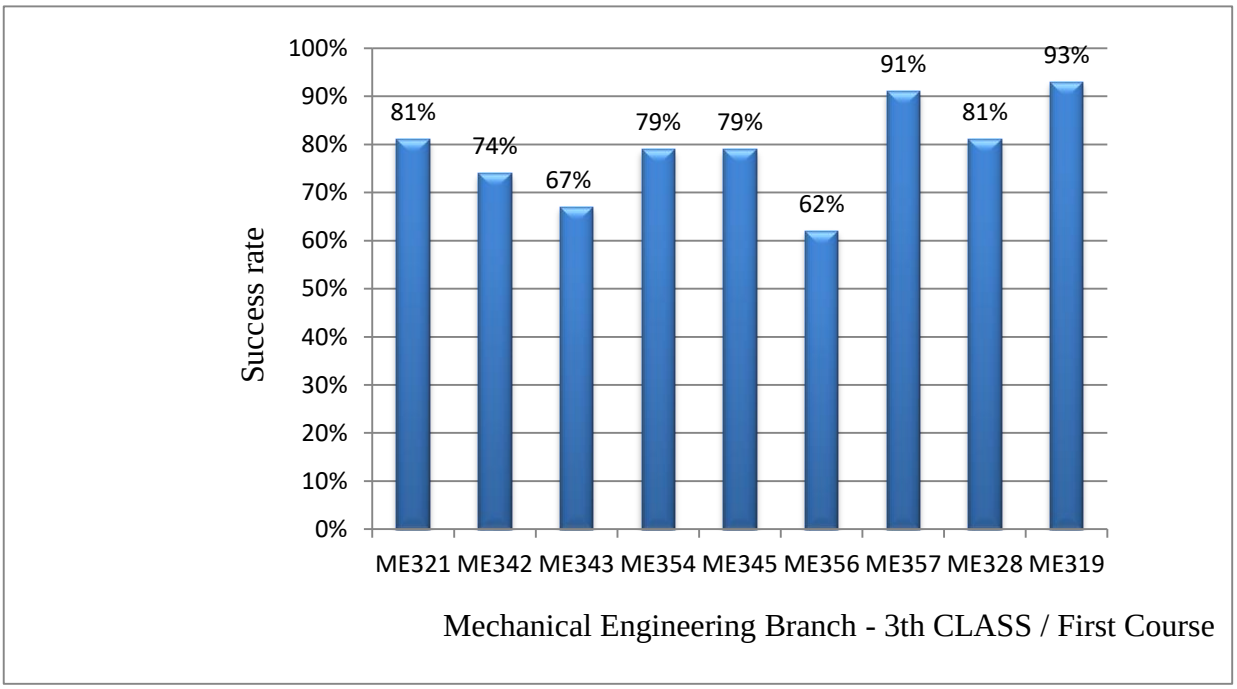



Success rate
100%
90%
80%
70%
60%
50%
40%
30%
20%
10%
0%
91%
79%
79%
61%
100%
53%
91%
78%
ME100
ME139
ME123
ME138
ME145
ME136
ME137
ME134
Mechanical Engineering Branch - FIRST CLASS / Second Course


Success rate
100%
90%
80%
70%
60%
50%
40%
30%
20%
10%
0%
70%
90%
70%
80%
80%
90%
80%
ME223
ME234
ME245
ME249
ME236
ME238
ME237
Mechanical Engineering Branch - SECOND CLASS / First Course



Mechanical Engineering Branch - SECOND CLASS / Second Course



Mechanical Engineering Branch - 3th CLASS / First Course

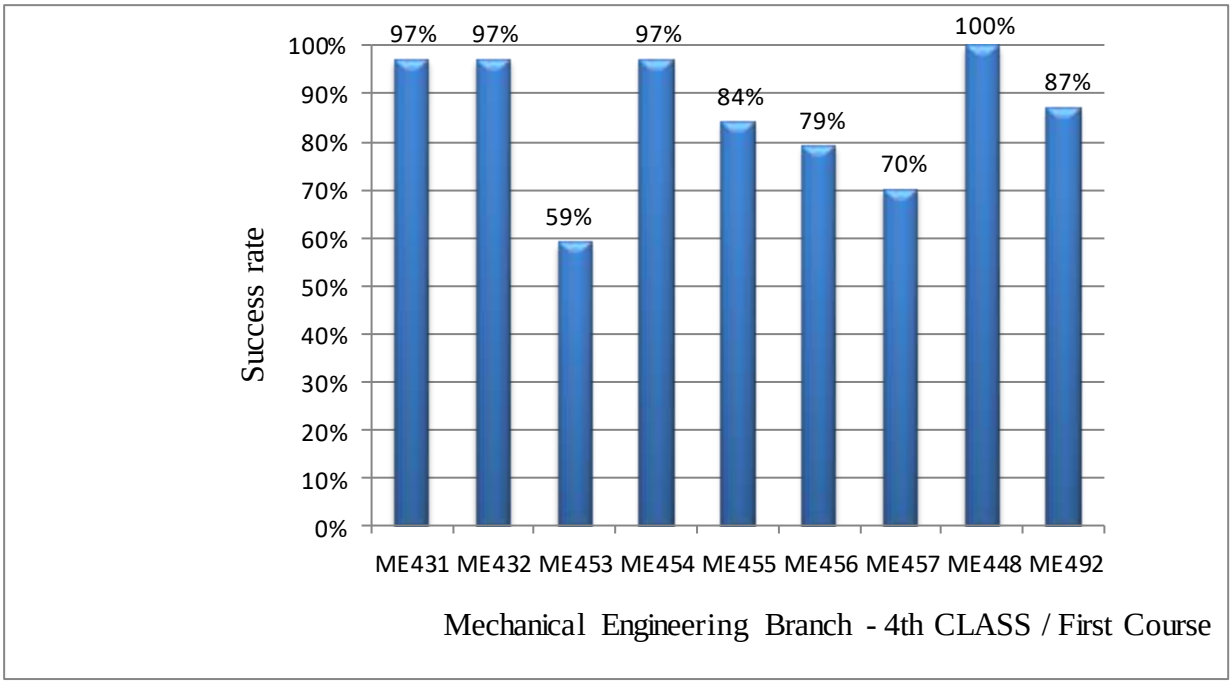
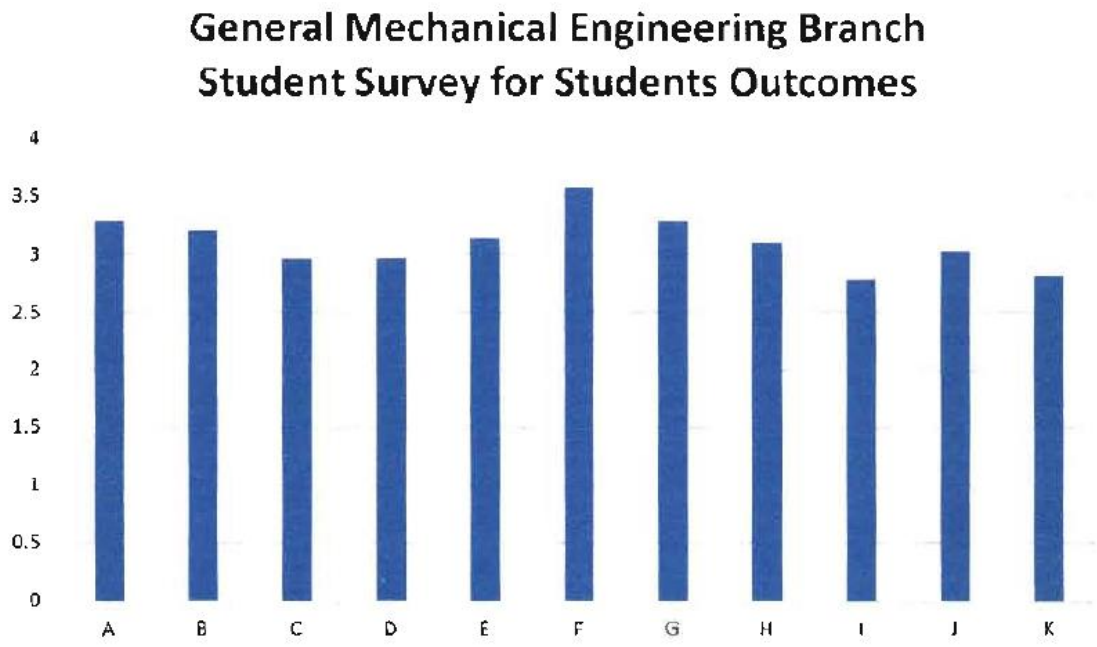


Fig. (4.3) Student outcomes performance through courses for first and second course for 2017-2018.

B.3. Student Outcome Survey at Exit Interview

The Final year students meet with the Department Chair and Dean at May. As a part of the exit interview, a survey is conducted for the assessment of Student Outcomes. In the survey, the graduating seniors were asked how competent they feel in the areas of the Student Outcomes (Ratings: 1= Disagree Strongly, 2 = Disagree Somewhat, 3 = Agree Somewhat, 4 = Agree Strongly) based on the education and training they received through the general mechanical engineering undergraduate program. Figure (4.4) shows the results of the survey with the average scores for each Student Outcome and program objectives for 2017-2018.



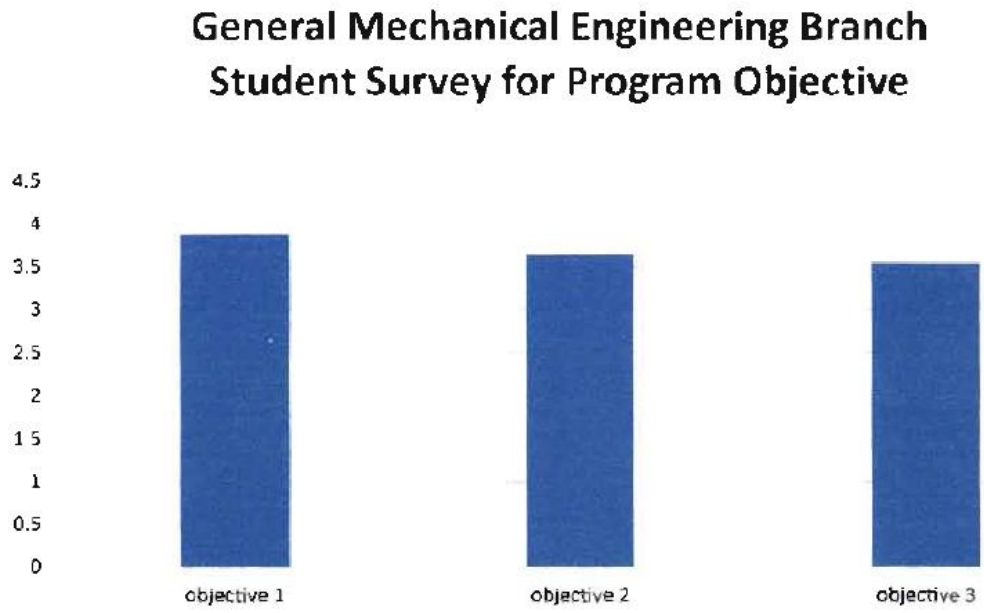


Fig. (4.4) Exit interview survey for student outcomes& program objectives.

B.4. Alumni Survey

The Alumni meet with the Department Chair and Dean at May. A survey is conducted for the assessment of Student Outcomes. In the survey, the alumni were asked how competent they feel in the areas of the Student Outcomes (Ratings: 1= Disagree Strongly, 2 = Disagree Somewhat, 3 = Agree Somewhat, 4 = Agree Strongly) based on the education and training they received through the general mechanical engineering branch undergraduate program. Figure (4.5) shows the results of the survey with the average scores for each Student Outcome for 2016- 2017.

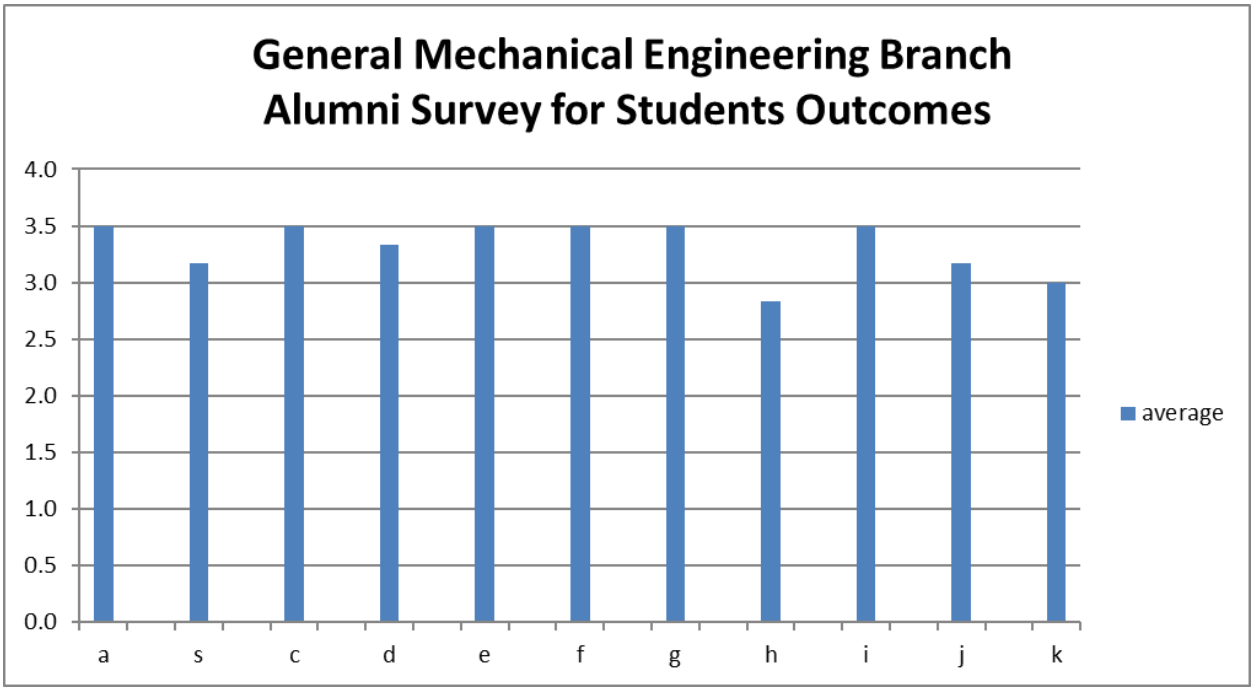


Fig. (4.5) Alumni survey for student outcomes

C. Continuous Improvement

C.1. Program Improvement by Assessment of Program Educational Objectives

To measure the level of achievement of the Program Educational Objectives (PEOs) by our graduates, the feedbacks from the alumni and employers of our graduates are utilized through the surveys. Both of the alumni survey and the employer survey were conducted in May at end of 2016-2017. The results showed that our graduates in average have achieved the PEOs and our graduates were comparable to the engineers from other schools as described in the previous section. The survey results were discussed at the general mechanical engineering branch faculty meetings and no particular action was taken for improvement of our program at this time. We have also received many comments and suggestions from our alumni and employers. At this time, the feedbacks on the two of most common subjects such as "more real world experience" and "better communication skills" were further discussed at the faculty meeting. Even though no particular action was taken for improvement of our program, it was suggested that the faculty should try to use more practical class examples and problems closely related to real world and to include more writing assignments and chance of oral presentation in each course schedule.

C.2. Program Improvement by Assessment of Student Outcomes

To measure the level of achievement of the Student Outcomes (SOs) by our students before their graduation, two assessment methods are being utilized including Course Assessment and SOs survey (Exit Interview and Alumni surveys) as described in the previous section. The assessment data are collected during the 2014-2015 and 2015-2016 for courses assessment and 2015-2016 for surveys. The data will analyze by the general mechanical engineering branch ABET coordinator during summer. Then, the assessment results are reviewed by the general mechanical engineering branch Undergraduate Committee to recommend possible actions for improvement to the general mechanical engineering branch faculty at September faculty meetings.

In order to keep update with scientific development in the modernization of the global vocabulary curricula of universities are the University of Technology in the re-evaluation of all the curriculum for all disciplines at the University for each Course (every four years) and is applied under the chronology for each session. In fulfillment of that, it was to instruct the Scientific Committee in the department to study the updated curriculum.

The Scientific Committee in the section the following actions:

1. Was formed specialized committees of the employees of the department headed by an expert in the field of specialties where guidance has been access to the old curriculum and curriculum comparable information available on the global network of universities and professors through specialists have been identified and additions to delete some of the topics that have been developed.
2. It has been the formation of committees of the heads of branches and heads of committees to re-evaluate the studies, according to terms of reference.
3. Was approved curriculum after the update by the Scientific Committee in the section included the following:
    i. First. Update rate ranged from 5% to 70% of an average of more than 30% for all disciplines.
    ii. Second. It has some of the material transfers between stages that do not affect the performance of the process of teaching and units.

D. Additional Information

Summer Training:

One of the requirements for obtaining a bachelor's degree in mechanical engineering is complete the students to sixty days of summer training in the corporate sector or the government sector, and this training is a mandatory component of the graduation requirements, and be under the auspices of the summer training in the section,

Graduation Project:

The graduation of a student completing the final phase requirements (fourth) Graduation Project are distributed graduation projects at the beginning of the school year by the scientific branches, according to the rates of students and a student graduating project to be completed and in the case of non-completion does not meet the terms of graduation. In addition, the distribution of students according to the plan prepared by the board of the department where possible to participate in the graduation project more than a student or one student for each project. The guidance to the Division of quality and performance of university and Heads of Branches in coordination with each other to select a pilot project through which participating seminars, conferences and official competitions .

CRITERION 5. CURRICULUM

A. Program Curriculum

A.1. Table 5-1 Curriculum

Table 5-1 illustrates the normal course sequence in the program along with the average section enrollment (lecture, laboratory, recitation) in each course. Table (5-1) is attached at the end of this section (Criterion 5. Curriculum).

A.2. Relation with Program Educational Objectives

The linkage between the Program Educational Objectives (PEOs) and the Student Outcomes (SOs) is shown in Table (5-2). The achievement of the Student Outcomes (SOs) ensures that our graduates are well equipped to achieve the Program Educational Objectives in actual practice following graduation.

A.2.1 General Mechanical Engineering Program Educational Objectives (PEOs):

The educational objectives of the undergraduate program in General Mechanical Engineering Branch are to produce graduates who (within a few years of graduation):

1. Successfully practice the mechanical engineering disciplines;
2. Contribute to society and the profession;
3. Engage in life- long learning to advance professionally through continuing education and training;
4. Succeed in graduate studies in mechanical engineering or a related field if pursued.

A.2.2 General Mechanical Engineering Branch Student Outcomes (SOs):

Students from the General Mechanical Engineering Branch program will attain (by the time of graduation):

a. an ability to apply knowledge of engineering, science, and mathematics (including multivariate calculus and differential equations);
b. an ability to design and conduct experiments, as well as to analyze and interpret data;
c. an ability to design systems, components, or processes to meet desired needs within realistic constraints;
d. an ability to function on multi-disciplinary teams;
e. an ability to identify, formulate, and solve energy and renewable energies engineering problems;
f. an understanding of professional and ethical responsibility;
g. an ability to communicate effectively in oral and written forms;
h. the broad education necessary to understand the impact of engineering solutions in a global, economic, environmental, and societal context;
i. a recognition of the need for, and an ability to engage in life- long learning;
j. a knowledge of contemporary issues in energy and renewable energies engineering;
k. an ability to use the techniques, skills, and modern engineering tools necessary for engineering practice.

A.3. Relation with Student Outcomes

To assure that our graduates have achieved the Student Outcomes (SOs), the curriculum must contribute for achievement of each Student Outcome collectively. As all the Student Outcomes are addressed within the core curriculum, students of the General Mechanical Engineering Program will be trained to achieve the Student Outcomes throughout the coursework. The ABET syllabi for the required courses describe a correlation of the course to the Student Outcomes as presented in Table (5-3).

A.4. Prerequisite Flow Chart

A flow chart showing the prerequisite structure of the General Mechanical Engineering Branch curriculum is attached after Table (5-1) at the end of this section (Criterion 5. Curriculum).

A.5. Major Components of the Program

The General Mechanical Engineering program produces graduates who are prepared to enter the practice of mechanical engineering. There are three major components of the program: (1) foundation in the mathematical and physical sciences, (2) engineering topics in mechanical with design applications, and (3) general education in the humanities and English course. Fig (5.1) show the detail distribution of the total topics of general mechanical engineering branch curriculum.

A.5.1. Mathematics and Physical Sciences

The engineering science fundamentals and engineering design skills are built upon the basic mathematics and physical sciences. The mathematics work begins with a three-course sequence (Math ME 123, ME 223) on differential and integral calculus. The two courses include topics in limits, derivatives, and the integrals of functions of one variable, work on partial derivatives and multiple integrals is presented. Vector analysis and three-dimensional analytical geometry is included in this course. Topics include solution of the first and second order linear differential equations with numerous applications. Laplace transforms, power series solutions, numerical methods and linear systems are included. With this foundation in mathematics, our students have necessary tools for applications in analysis and design. ME 321 Numerical analyses with particular applications in numerical differentiation and integration.

ME 138/ Properties of Material, the aims which can be achieved during teaching this course program are concept of materials science, classification of materials, atomic structure and the type of bonding forces, types of materials and their applications and the mechanical material properties.

It was noted that the number of hours for Math and Properties of Material is less than ABET requirement. In next year (2016-2017), the number of hours will increase to from 12 to 32 hours, each credit hours for Math (I, II, III) and Properties of Material will increase from 4 to 8 hours.

A.5.2. Engineering Topics

The aim of the program is to graduate students capable to work as mechanical engineer in mechanics field. The engineering topics are divided into two parts; preliminary general courses, general mechanical courses.

Preliminary general courses:

1. ME145/ Workshop Training; Preparation of engineering cadres trained scientific and practical areas in the electricity, automobiles, machining (lathe, milling, drilling), forging, denting, filings, forging, welding, and casting.
2. Computer Programming, I Courses; ME122/ Computer Science (Visual BASIC programs), ME222/ Advanced Programming (C++) and (Microprocessors and MATLAB languages), ME328 /Advanced Computer Applications (Computer Added Design (CAD)), ME429 / Computer Added Eng. (CAE).
3. ME238/ Manufacturing Processes, ME319/ Industrial Engineering, determine the most effective ways for an organization to use the basic factors of production.
4. ME134/, ME234/ Engineering and Machine Drawing is to teach students manual drafting and dimensioning of views, explains the principles of orthographic views, multi view projection and sectional view drawing.
5. ME448/ Project, should be in the mechanical engineering (designing fields, vibration fields, material mechanical properties fields, mechanical control fields, fluid mechanics fields, Gas dynamics fields).

Mechanical Courses,

1. ME137& ME237/ Engineering Mechanics, This unit of study aims to provide theoretical knowledge and principles of statics and Dynamics…

2. ME342/ Theory of Machine, illustration and discussion the Main the application of theory of machine for the solution of equation(s) for velocity and acceleration, gear and gear train, belt, fly wheel and friction clutches that occur in most engineering of mechanical field…

3. ME454/ Mechanical Vibration, illustration and discussion the principles of free & forced vibrations and definition, Proceeding to the Student free & forced vibrations of single degree of freedom, Multiple degree of freedom**,** Dynamic absorber (undamped), Vibration isolation-Transmissibility-Discussion of transmissibility behavior, Mode shapes, torsional vibration, vibration of continuous system…

4. ME432/ Automatic Control, illustration and discussion the Main Theoretical Principles of control systems and understanding of using different system Damping. Mechanical system and Transfer Function, Block diagram, Control systems, response of first and second order system, system stability, and applications…

5. ME136 & ME236/Thermodynamics, Fundamental thermodynamic concepts including system, state, state postulate, equilibrium, process and cycle, Heat, work, 1st Law of Thermodynamics, Properties of a substance, Energy balances for idealized closed systems, Energy and mass balances for idealized control volumes, 2nd Law of Thermodynamics, Carnot cycles, thermal efficiencies, Entropy, isentropic processes, isentropic efficiencies, idealized power cycles (Otto, Diesel and Rankine)…

6. ME 249 & ME356/ Fluid Mechanics, It provides a working knowledge of Fluid Mechanics and Illustration and discussion the principles of Principle of fluid motional flow classification Bernoulli's equation as well as applications of Bernoulli's equation and anther subject in Fluid Mechanics…

7. ME345/ Heat Transfer; teach theoretical basics of the conduction, convection and radiation heat transfer Coincided with a laboratory experiment…

8. ME 453/ Power Plants, studying the thermal analysis of the steam and gas turbine plants…

9. ME 457/ Gas Dynamics, Introduction to gas dynamics, exploring the fundamental equations for gas dynamics through the control volume approach by deriving the Reynolds transportation theorem. Deriving the governing equations for different compressible flows using Reynolds transportation theorem. Studying the mechanism of formulations of compression and expansion waves. Studying the performance of several mechanical components such as nozzles, diffusers, pipes under friction effect or heat exchange with surrounding with or without the present of shock waves, the aerodynamic characteristics of the supersonic airfoils under wave shock system. The aerodynamic characteristics of thin airfoils under compressible flow effect…

10. ME343 & 454/ Machine Design, illustration and discussion the general concepts to design necessary mechanical elements for example, Joining various mechanical elements to reach a mechanical system used in various fields, Establish a set of criteria to develop the imagination of the students to analyze forces and stresses for the elements to be designed and how to use standard tables and graphs, also how to select the suitable material for assumed or given factor of safety. Introduces the fundamental of design methodology by following up the system design flowchart. Topics include the failure analysis of machine elements such as columns, belts, chain and gears. Upon completion, students should be able to analyze and solve any mechanical design problem and arriving to optimum idea….

11. ME 364/ Air-Conditioning systems, learn the principles of the air conditioning systems and how they are designed it.

12. ME139/ Electrical Engineering, illustration and discussion the fundamental f electric engineering and definition, proceeding to the student the DC Electrical Circuits, series, parallel, series-parallel and identify the equations voltages &current for circuits above.

13. ME245/ Strength of materials, studying the stresses and strains of materials and its deflections. The student acquires the basis of the Strength of Materials. In this way, the student will be able to pre-design different types of simple elements, for mechanical components, structures and buildings…

14. ME431/Measurements, Define the basis and the fundamentals of the measuring devices, and description the types of measuring devices for length, weight, time, temperature, light, pressure, velocity, flow, surface finish, force, torque, and the analytical of experimental data…

15. ME354 / Internal Combustion Engine, This course provides the material needed for the basic understanding of the operation and performance of internal combustion engines, learn to classify different types of internal combustion engines and their applications. Know the fundamental thermochemistry as applied to fuels, types of fuels, combustion and pollution. Estimate the performance of internal combustion engines…

16. ME357/ Production Engineering, Definition of the basic concepts and production processes and methods of production and project planning in all its forms, as well as modern methods layout of production system to improve the productivity and various properties of materials…

A.5.3. General Education

The third major area of the curriculum is the general education component. The University of Technology has a mandated General Education Requirements for all degrees. To satisfy the General Education Requirements the, General Mechanical Engineering Program set required courses in the general education component as follows:

EMEE 112/ English Language, this course will improve the ability of the students to understand, speak, read and write English as a second language with some technical texts. It is also intended to teach them, how to use technical English effectively as a language of instruction, Lab. Experiments and Exercises, examples, using Technical Terminologies as close as possible to the lectures they receive during their study.

ME111/ Human Rights & Democracy., Freedom and Democracy, the course covers the concept of human rights and development, definition, classes, properties, and the most important human rights conventions and declarations and international conventions on human rights, and human rights in religions and the role of non-governmental organizations in this field and other human rights issues. The substance of freedom and democracy include the concept of freedom and kinds, democracy and the types and components, individual liberty and freedom forced to reconcile the sovereignty, freedom, democracy during the Greeks time, lobbyists, the most important theories on the nature of election, the rights of minorities in democratic governance and other topics that make the student familiar with the issues.

A.6. Major Design Experience

In the last year, students take Senior Capstone Design, which is the final major design course. In this course, students learn how to apply the basic engineering science and design principles to formulate a design problem, and then follow recommended process to complete the design project. Students are required to demonstrate their ability to use the knowledge of mechanical and electrical courses for the whole undergraduate curriculum. Some professional components if not taught in other courses, such as ethics, life- long learning to keep knowledge up to date, are covered in this course. For the capstone design experience. The students are typically in teams of three people. At the end of the year, all the design teams present their capstone design projects. All the General Mechanical Engineering Branch faculty members, representatives from industry and General Mechanical Engineering Industrial Advisory Council members are invited at the presentation and they also serve as evaluators for the capstone design projects. The evaluation includes the project evaluation in three parts (overall technical content, presentation, and response to questions), assessment of the related Student Outcomes and comment.

A.7. Cooperative Education

The General Mechanical Engineering Branch Program have 4 weeks training in nearby industries during summer after second and third year (two week after each year). Their participants in the training will give them experience in real engineering work in industries. They also have meetings in final year with University Career Services.

A.8. Teaching Materials and Student Work Samples

For the required courses only, teaching materials (textbook, the regular course syllabus, course outlines, and list of assignments, etc.), and student work samples of all the assignments (homework, quizzes, exams, lab reports, and design projects, etc.) will be available for review at the time of visit.

B. Course Syllabi

The ABET course syllabi for all the required courses are contained in Appendix A, includes the courses taught by the General Mechanical Engineering Branch faculty, include a syllabus for each course used to satisfy the mathematics, science, and discipline-specific requirements required by Criterion 5 or any applicable program criteria.

Table (5-1) Curriculum

General Mechanical Engineering Branch

Course (Department, Number, Title) List all courses in the program by term starting with first term of the first year and ending with the last term of the final year.	Indicate Whether Course is Required, Elective, or a Selective Elective by an R, an E or an SE[2]	*Curricular Area (Credit Hours)*				Last Two Terms the Course was Offered: Year and, Semester, or Quarter	Average Section Enrollment for the Last Two Terms the Course was Offered[1]
		Math & Basic Sciences	Discipline Specific Topics	General Education	Other		
First Year (first course)							
Human Rights & Democracy	**R**			**2**		2017-2018	100
Programming I	**R**	**2**				2017-2018	100
Mathematics I	**R**	**4**				2017-2018	100
Engineering Drawing &Descriptive Engineering	**R**			**4**		2017-2018	100
Workshops I	**R**	**6**				2017-2018	100
Thermodynamics I	**R**		**4**			2017-2018	100
Mechanics I	**R**	**4**				2017-2018	100
First Year (second course)							
English Language	**R**			**2**		2017-2018	100
Electrical Engineering	**R**	**3**				2017-2018	100
Mathematics II	**R**	**4**				2017-2018	100
Properties of Material	**R**	**2**				2017-2018	100
Workshops II	**R**	**6**				2017-2018	100
Thermodynamics II	**R**		**4**			2017-2018	100
Mechanics II	**R**	**4**				2017-2018	100
Engineering Drawing	**R**			**3**		2017-2018	100

Second Year(first course)							
Mathematics III	**R**	**4**				2017-2018	100
Mechanical Drawing+ CAD	**R**		**3**			2017-2018	100
Strength of Materials I	**R**		**3**			2017-2018	100
Thermodynamics III	**R**		**4**			2017-2018	100
Mechanics III	**R**		**3**			2017-2018	100
Manufacturing Processes	**R**		**4**			2017-2018	100
Fluid Mechanics I	**R**		**4**			2017-2018	100
Second Year(second course)							
Engineering & Numerical Analysis	**R**	**4**				2017-2018	100
Strength of Materials II	**R**		**3**			2017-2018	100
Fluid Mechanics II	**R**		**4**			2017-2018	100
Thermodynamics IV	**R**		**4**			2017-2018	100
Mechanical & Electronic Systems	**R**		**2**			2017-2018	100
Programming II	**R**	**2**				2017-2018	100
Mechanics IV	**R**		**3**			2017-2018	100
Third Year							
Engineering & Numerical Analysis	**R**	**4**				2017-2018	100
Theory of Machines	**R**		**4**			2017-2018	100
Machine Design I	**R**		**4**			2017-2018	100
Heat Transfer	**R**		**4**			2017-2018	100
Fluid Mechanics II	**R**		**4**			2017-2018	100
Production Engineering	**R**	**2**				2017-2018	100
Computer Aided Design	**R**	**4**				2017-2018	100
Industrial Engineering	**R**		**2**			2017-2018	100
Internal Combustion Engines	**R**		**3**			2017-2018	100

	Fourth Year						
Air-Conditioning and Refrigeration	**R**		**2**			2017-2018	100
Gas Dynamics	**R**		**4**			2017-2018	100
Measurement	**R**	**2**				2017-2018	100
Automatic Control	**R**		**3**			2017-2018	100
Power Plants	**R**		**4**			2017-2018	100
Machine Design II	**R**		**4**			2017-2018	100
Mechanical Vibrations	**R**		**4**			2017-2018	100
Project	**R**	**4**				2017-2018	100
Computer Aided Engineering	**R**	**4**				2017-2018	100
Add rows as needed to show all courses in the curriculum.							
OVERALL TOTAL CREDIT HOURS FOR THE DEGREE		***124 hours per a week***				***3570 hours for B.sc.***	
PERCENT OF TOTAL		*38%*	*57%*	*6.4%*	*0%*		

Material correlation in the description of courses curriculum

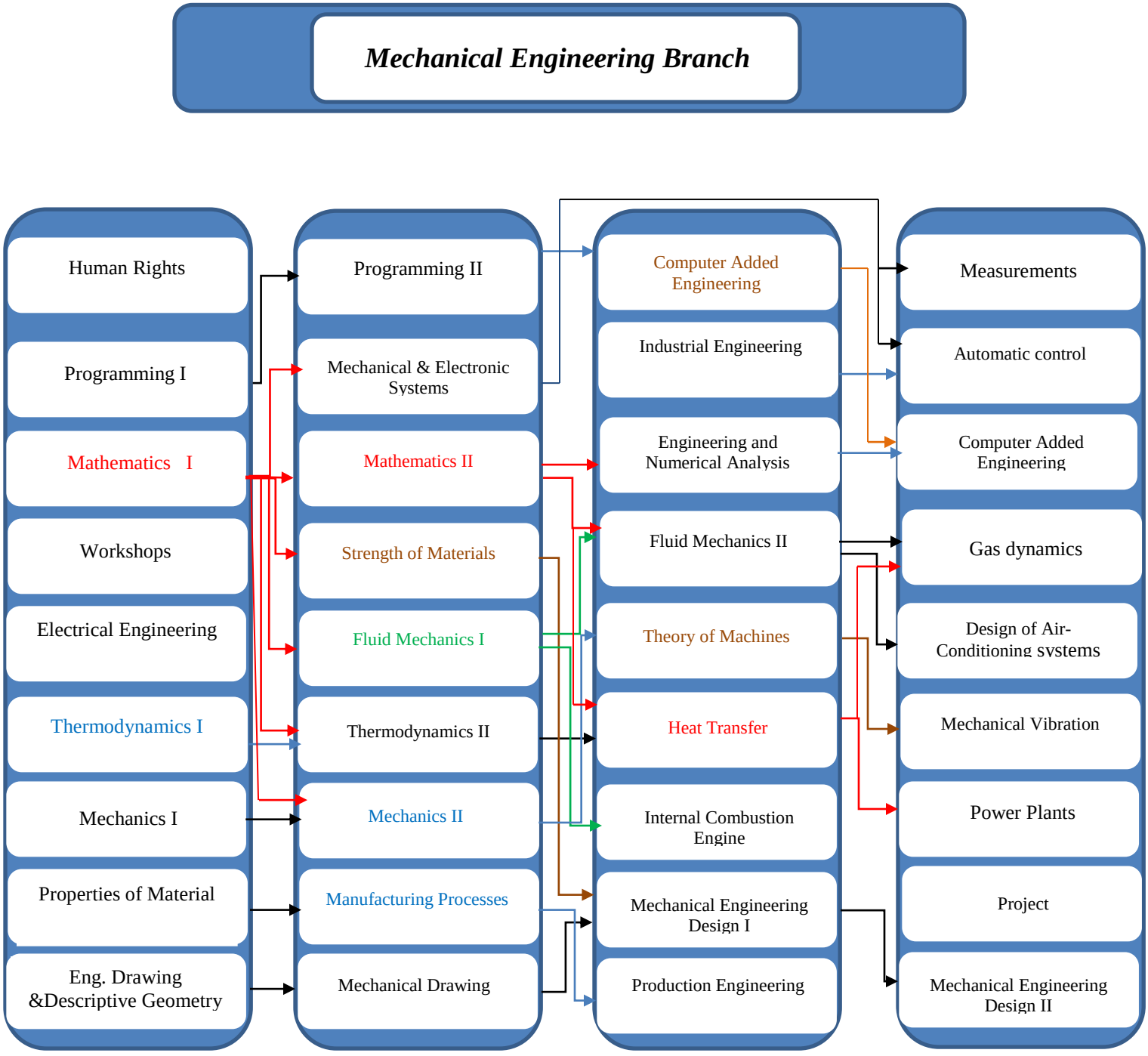


Table (5-2) Mapping of Program Educational Objectives PEOs to Student Outcomes SOs

PEOs	Student Outcomes (SOs)										
	a	b	c	d	e	f	g	h	i	j	k
PEO #1	X	X	X	X	X		X				X
PEO #2						X		X		X	
PEO #3	X							X	X	X	
PEO #4	X	X	X	X	X	X	X	X	X	X	X

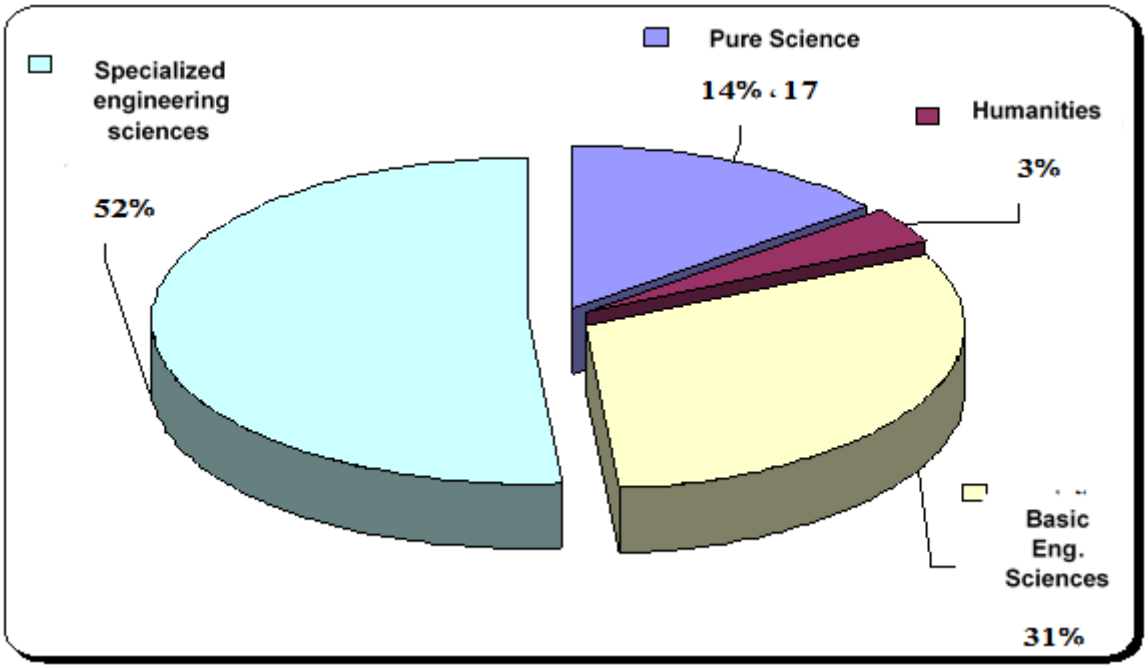


Fig (5.1) detailed distribution of the total topics of mechanics branch curriculum.

Table (5-3) Contribution of Required Courses to Student Outcomes

Curriculum		(standards of the Accreditation Board for Engineering and Technology (ABET)										
First Class (FIRST COURSE)												
Code	**Name**	**a**	**b**	**c**	**d**	**e**	**f**	**g**	**h**	**i**	**j**	**k**
ME/111	Human Rights & Democracy						•					
ME/122	Programming I			•		•						•
ME/123	Mathematics I	•				•						
ME/134	Eng. Drawing &Descriptive											•
ME/145	WorkshopsI				•		•					
ME/136	Thermodynamics I	•	•			•						
ME/137	Mechanics I	•	•			•						
First Class (SECOND COURSE)												
ME100	English Language											
ME/139	Electrical Engineering	•	•			•						
ME/123	Mathematics II	•				•						
ME/138	Properties of Material			•		•						
ME/145	Workshops II				•		•					
ME/136	Thermodynamics II	•	•			•						
ME/137	Mechanics II	•	•			•						
ME/134	Engineering Drawing											•
Second Class(FIRST COURSE)												
ME/223	Mathematics III	•				•						
ME/234	Mechanical DrawingII			•								•
ME/245	Strength of Materials	•	•	•								
ME/236	Thermodynamics III	•	•			•						
ME/237	Mechanics III	•	•									
ME/238	Manufacturing Processes		•			•	•				•	•
ME/249	Fluid Mechanics I	•	•			•						
Second Class(SECOND COURSE)												
ME/223	Engineering & Numerical Analysis	•	•			•						•
ME/245	Strength of Materials II	•	•	•								
ME/249	Fluid Mechanics II	•	•			•						
ME/236	Thermodynamics IV	•	•			•						
ME/251	Mechanical & Electronic Systems							•				•
ME/222	Programming II	•										
ME/237	Mechanics IV	•	•									
Third Class												
ME/321	Engineering & Numerical Analysis	•	•			•						•
ME/342	Theory of Machines	•	•	•	•	•		•				
ME/343	Machine Design I	•	•	•	•	•	•	•	•	•	•	•
ME/354	Internal Combustion Engine Parts Design	•	•		•	•		•		•		
ME/345	Heat Transfer	•	•	•		•				•		
ME/356	Fluid Mechanics II	•	•			•				•		

ME/357	**Production Engineering**		•	•	•		•	•	•	•	•	
ME/328	**Computer Added Design**			•	•	•		•				•
ME/319	**Industrial Engineering**	•	•		•	•	•	•	•		•	
Fourth Class												
ME/431	**Measurement**	•	•	•	•	•				•		
ME/432	**Automatic Control**	•	•			•						
ME/457	**Gas Dynamics**	•	•	•		•				•		
ME/456	**Air-condition**	•	•	•		•	•	•	•		•	
ME/429	**Computer Added Eng.**	•	•			•					•	•
ME/453	**Power Plants**	•	•			•				•		
ME/454	**Machine Design II**	•		•	•	•		•		•		
ME/455	**Mechanical Vibrations**	•	•	•	•	•				•		
ME/448	**Project**	•	•	•	•	•	•	•	•	•	•	•

Table (5-4) Program Curriculum Overview and Relationship of Courses in the Curriculum to the PEO for ME Program

Categories	Subject	Credit	Total	PEO_1	PEO_2	PEO_3
Mathematics	Mathematics I	4	8	×	×	×
	Mathematics II	4		×	×	×
Science & Engineering	Eng. Drawing & Descriptive Eng.	4	24	×	×	×
	workshops	6		×	×	×
	Mechanics I	4		×	×	
	Properties of Material	2		×	×	
	Engineering & Numerical Analysis	4		×	×	
	Production Engineering	2		×	×	
	Measurement	2		×	×	
Engineering	Thermodynamics I	4	69	×	×	
	Mechanical & Electronic Systems	2		×	×	
	Mechanical Drawing	3		×	×	
	Strength of Materials	3		×	×	
	Thermodynamics II	4		×	×	
	Mechanics I	3		×	×	
	Manufacturing Processes	4		×	×	
	Fluid Mechanics I	4		×	×	
	Theory of Machines	4		×	×	
	Machine Design I	4		×	×	×
	Heat Transfer	4		×	×	
	Fluid Mechanics II	4		×	×	
	Industrial Engineering	2		×	×	
	Internal Combustion Engines	3		×	×	
	Air-Conditioning Refrigeration	2		×	×	
	Gas Dynamics	4		×	×	
	Automatic Control	3		×	×	
	Power Plants	4		×	×	
	Machine Design II	4		×	×	×
	Mechanical Vibrations	4		×	×	
Computer hardware & Software	Programming I	2	4	×	×	
	Programming II	2		×	×	
	Computer Aided Design	4	8	×	×	
	Computer Aided Engineering	4		×	×	
Electrical Engineering	Electrical Engineering	3	3	×	×	
Project		4	4	×	×	×
General education	Human Rights & Democracy	2	2	×		
	English language	2	2	×		
Total			124			

CRITERION 6. FACULTY

A. Faculty Size

The number of faculty members in the General Machines Engineering Branch for the academic year 2016-2017 is (21). It is enough to cover the required courses, and also to perform other tasks related to program evaluation and continuous improvement. The faculty is composed of 66.6 % of doctorate degree holders and 33.3% of master's degree holders. According to gender , the faculty members of the males is 76.2% and females is 23.8 % , and according to scientific degree , 9.5 % professors , 23.8% assistant professors, 42.8 % teachers , and 23.8% assistant teachers .

The faculty is branching into interdisciplinary and several areas of technology in mechanical engineering can be classified into three major specialties: Refractory, Applied Mechanics, and Production Engineering. Number of faculty members in each discipline allows the department to provide all required in the field of primary educational program in mechanical engineering during a year.

Table (6-1) shows the faculty members and classifies them according to their specialties. (It should be noted here that there are a number of faculty members are enrolled in graduate studies for a doctorate inside and outside Iraq).

Table (6-1) the number of faculty according to their classifications and specializations for 2016-2017.

Specialization	Certificate		scientific title				Gender	
	Ph.D.	MSc.	Professor	Assistant Professor	teacher	assistant teacher	Male	Female
Applied Mechanics	7	4	1	2	5	3	10	1
Refractories	4	1	-	2	3	-	4	1
Production Engineering	2	-	-	1	1	-	2	-
Other	1	2	1	-	-	2	-	3
Total	14	7	2	5	9	5	16	5

B. Professional Development

In faculty vitae

C. Faculty Workload

Teaching Load

General Machines Engineering Branch gives priority in the appointment of faculty members to the doctoral graduates of world prestigious universities. Number of faculty members had been changed over the past ten years (depending on the circumstances of the country). Load of teaching is being distributed according to the scientific rank of faculty members, and as follows: 6 credit hours maximum for Professor 8 credit hours maximum for Assistant Professor 10 credit hours maximum for a teacher, and 12 credit hours maximum for an assistant teacher. Any additional load for faculty member is being compensated financially.

Table (6-3) shows the amount of full-time work of faculty members for the academic year 2015-2016.

D. Authority and Responsibility of Faculty

Instructions for the job description of faculty members

Article 1

A faculty member at University of Technology teaches, performs academic research, provides educational guidance and academic supervision to the students of undergraduate and postgraduate students, provides experience, and participates in academic and other committees.

Article 2

Faculty members dedicate their time to teach at the university. The college council may approve an exception for a faculty member from full-time commitment for reasons that the council finds convincing.

Article 3

I. The faculty member shall work a minimum of (35) thirty-five hours per week.

II. The faculty member shall conduct academic research in accordance to an annual academic plan suggested by the academic department, recommended by the college council, and authorized by the university council, provided that the member shall complete at least one study per year.

III. Hours spent in providing academic supervision and educational guidance by faculty members tasked to do so are considered lectures at the rate of one hour per group, but shall not exceed (4) four hours per week.

IV. The faculty member shall participate in:

a. University activities (cultural fairs, University Day, college exhibitions, graduation ceremonies, and student events, as well as other academic, social, and educational events upon request.

b. Writing, translation, and publishing.

c. Membership in permanent councils and committees inside and outside the university. One additional hour shall be noted for membership in a permanent council.

d. Intellectual, educational, and academic development of the academic departments by submitting studies, research, reports, plans, educational syllabi, etc.

e. Conducting tests and monitoring their conduct.
f. Seminars, conferences, and classes in Iraq and abroad.
g. Continuing education courses held at the university and elsewhere.
h. Working at the University's specialized advisory centres, offices, and clinics.
V. The department head shall determine the number of hours needed to accomplish the tasks provided in item IV of this article, which are among the duties of the faculty member, provided that such hours shall not be counted against his quota or articles except for the provisions of item III and paragraphs (c) and (e) of item IV of this article.

Article 4
I. The faculty member's weekly quota shall be as follows:
a. Professor: (8) eight teaching hours.
b. Adjunct: (10) ten teaching hours.
c. Lecturer: (12) twelve teaching hours.
II. The quota may be reduced by no more than two thirds of the quota for those employed at the university's research centres.
III. The number of the faculty member's classroom and practical teaching hours shall be at a rate of hours per week as authorized for the academic rank.
IV. The quota for the faculty member shall be limited to classroom and practical teaching hours, supervision of undergraduate and postgraduate projects, academic supervision, and educational guidance.
V. Two hours shall be reduced from the quota of faculty members whose are fifty years old or older.
VI. The quota for the faculty member during university vacations and the summer quarter shall be zero.

Article 5
Classroom and practical teaching hours for a full-time university faculty member shall be calculated according to the following:
I. The upper limit for theoretical subjects in a single quarter is (3) three subjects in his or her specialty, which may be increased by one subject only in cases of absolute necessity as determined by the college council and subject to the approval of the president of the university.
II. Each hour of practical, applied, or field teaching, training, or discussion shall be calculated as one hour.
III. Supervision of each graduation research project at the undergraduate level shall be calculated as two hours per week, provided that the number of projects supervised is no more than (4) four.
IV. Supervision of each postgraduate student's dissertation shall be calculated as follows:
a. (3) Three preliminary theoretical hours in the first week for a high diploma.
b. (4) Four preliminary theoretical hours in the first week for a master's degree.
c. (6) Six preliminary theoretical hours in the first week for a doctorate.
V. In cases of joint supervision, supervision hours and bonuses are accounted in full for each of the supervisors.
VI. Each hour of teaching at the postgraduate level shall be accounted as the equivalent of two theoretical hours at the undergraduate level for the purposes of compensation for extra lectures.
VII. A faculty member may exclusively teach or supervise postgraduate dissertations, or combine the two, when necessary, with the approval of the college council.

Article 6

I. The number of doctoral theses simultaneously supervised by a faculty member shall not be more than (3) three.

II. The number of magisterial dissertations simultaneously supervised by a faculty member shall not be more than (3) three. However, in cases of absolute necessity, subject to the recommendation of the competent department and the approval of the college council, the number may be increased to no more than (6) six dissertations.

III. Joint supervision of dissertations is possible in cases specified by the department council and authorized by the college council. In such cases, compensation shall be as specified in item V of article 5 of these instructions.

IV. The number of professional higher diplomas supervised by the faculty member shall not be more than (4) four, which may be increased to no more than (6) six in cases of absolute necessity by a decision from the college council.

V. No more than nine dissertations may be supervised individually or jointly.

VI. If a faculty member has supervisory duties of one type (doctoral, magisterial, or higher diploma), supervision shall be as follows:

a. (5) Five doctoral dissertations

b. (7) Seven magisterial dissertations

c. (9) Nine higher diploma dissertations

Article 7

I. The president of the university, as required for the general good, may task a member of the faculty with duties related to the overall academic, educational, and administrative activities. In such a case, the faculty member be entitled to additional hours of no more than (6) six hours per week.

II. The college council may allocate no more than (4) four additional hours per week to the faculty member if the faculty member is tasked with duties related to the development of the educational or administrative process, provided that this takes place at the start of each educational year or quarter.

Article 8

The weekly quota is:

I. Dean: Zero

II. Assistant Dean: (4) four hours.

III. Department head: (4) four hours.

Article 9

I. The quota of the department coordinator is reduced by (4) four hours per week.

II. The college council may reduce the quota of the person tasked to be the postgraduate coordinator by no more than (4) four hours per week.

Article 10

I. A part-time faculty member who is a physician, dentist, or pharmacist who is employed at the university hospital shall teach the same number of hours as a full-time member of the university service of equal academic rank.

II. A part-time faculty member shall work no fewer than (30) thirty hours distributed as required by the college. Any additional hours shall be treated as overtime pursuant to the effective instructions on lecture pay.
III. Priority shall be given to full-time faculty members when forming branch councils.
IV. Part-time faculty members may practice their professions outside of official working hours.
V. Priority shall be given to full-time faculty members in academic courses and dispatches.

Article 11
A part-time faculty member shall teach the same quota for his or her academic rank as a fill-time member, provided that his or her weekly hours are no more than (29) twenty-nine hours.

Article 12
The Chancellor of the university may dedicate faculty members to work at the university administration, academic research centres, and academic authorities and centres.

Table (6-2) Faculty Qualifications

General Mechanical Engineering Branch

Faculty Name	Highest Degree Earned- Field and Year	Rank [1]	Type of Academic Appointment[2] T, TT, NTT	FT or PT[3]	Years of Experience			Professional Registration/ Certification	Level of Activity[4] H, M, or L		
					Govt./Ind. Practice	Teaching	This Institution		Professional Organizations	Professional Development	Consulting/summer work in industry
Shaker Sakran Hassan	**Phd.**	**P**	**T**	**FT**	**40**	**36**	**14**		**H**	**H**	**M**
Ahlam Taha Hussein	**Phd.**	**P**	**T**	**FT**	**40**	**36**	**14**		**H**	**M**	**M**
Mufaq Ali Tawfeq	**Phd.**	**AST**	**T**	**FT**	**40**	**37**	**40**		**H**	**H**	**M**
Samir Ali Amin	**Phd.**	**AST**	**T**	**FT**	**24**	**10**	**10**		**M**	**M**	**L**
Sadiq Hussain Bakhi	**Phd.**	**AST**	**T**	**FT**	**14**	**14**	**14**		**H**	**H**	**L**
Sattar J. Habeeb	**Phd.**	**AST**	**T**	**FT**	**14**	**14**	**14**		**M**	**L**	**L**
Sadiq Jafar Azez	**Phd.**	**AST**	**T**	**FT**	**25**	**25**	**25**		**H**	**M**	**M**
Kadem Ali Hassan	**Phd.**	**I**	**T**	**FT**					**H**	**M**	**M**
Ali Raad Hassan	**Phd.**	**I**	**T**	**FT**	**19**	**6**	**6**		**M**	**L**	**L**
Ali Lafta Kaed	**Phd.**	**I**	**T**	**FT**	**14**	**14**	**14**		**H**	**M**	**L**
Ihsan A .Hussain Baqer	**Phd.**	**I**	**T**	**FT**	**10**	**10**	**10**		**H**	**M**	**M**
Mohanad Yousuf Hanna	**Phd.**	**I**	**T**	**FT**	**12**	**12**	**12**		**M**	**M**	**L**
Ibrahem mousa hassan	**Phd.**	**I**	**T**	**FT**	**15**	**6**	**6**		**M**	**L**	**L**
Wisam Abed Kattea	**Phd.**	**I**	**T**	**FT**	**12**	**9**	**12**		**L**	**M**	**L**
Sahra Hassan	**Phd.**	**I**	**T**	**FT**					**H**	**M**	**L**
Najmuldeen Yousif Mahmood	**Msc.**	**I**	**T**	**FT**	**6**	**6**	**6**		**M**	**M**	**L**
Shaimaa Hilal Kamel	**Msc.**	**A**	**T**	**FT**	**8**	**8**	**8**		**M**	**L**	**L**
Orhan Sabah Abdullah	**Msc.**	**A**	**T**	**FT**	**4**	**4**	**4**		**H**	**M**	**M**
Ali Hussein Alwan	**Msc.**	**A**	**T**	**FT**	**11**	**3**	**11**		**H**	**M**	**M**
Sarah Jasim Mohammed	**Msc.**	**A**	**T**	**FT**	**9**	**3**	**9**		**H**	**M**	**L**
Shaimaa kadim mohsen	**Msc.**	**A**	**T**	**FT**	**9**	**3**	**9**		**H**	**M**	**L**

Instructions: Complete table for each member of the faculty in the program. Add additional rows or use additional sheets if necessary. Updated information is to be provided at the time of the visit.

1. Code: P = Professor AST = Assistant Professor I = Instructor A = Adjunct O = Other2. Code: TT = Tenure Track T = Tenured NTT = Non Tenure Track

Table 6-3. Faculty Workload Summary

Name of Program

Faculty Member (name)	PT or FT[1]	Classes Taught (Course No./Credit Hrs.) Term and Year[2]	Program Activity Distribution[3]			% of Time Devoted to the Program[5]
			Teaching	Research or Scholarship	Other[4]	
Shaker Sakran Hassan	**FT**	**ME 237**	**70%**	**20%**	**10%**	**100%**
Ahlam Taha Hussein						
Mufaq Ali Tawfeq	**FT**	**ME 455**	**70%**	**20%**	**10%**	**100%**
Samir Ali Amin	**FT**	**ME 319**	**70%**	**20%**	**10%**	**100%**
Sadiq Hussain Bakhi	**FT**	**ME 123**	**70%**	**20%**	**10%**	**100%**
Sattar J. Habeeb	**FT**	**-**	**0%**	**0%**	**0%**	**0%**
Sadiq Jafar Azez	**FT**	**ME 357**	**60%**	**20%**	**20%**	**100%**
Kadem Ali Hassan						
Ali Raad Hassan	**FT**	**ME 123**	**70%**	**20%**	**10%**	**100%**
Ali Lafta kaed	**FT**	**ME 249**	**70%**	**20%**	**10%**	**100%**
Wisam Abed Kattea	**FT**	**-**	**0%**	**0%**	**0%**	**0%**
Ihsan A .Hussain Baqer	**FT**	**ME 454**	**60%**	**10%**	**30%**	**100%**
Mohanad Yousuf Hanna	**FT**	**ME 343**	**60%**	**10%**	**30%**	**100%**
Sahra Hassan						
Ibrahem mousa hassan	**FT**	**LAP.**	**50%**	**50%**	**0%**	**100%**
Najmuldeen Yousif Mahmood	**FT**	**ME 343**	**70%**	**20%**	**10%**	**100%**
Shaimaa Hilal Kamel	**FT**	**LAP.**	**50%**	**50%**	**0%**	**100%**
Orhan Sabah Abdullah	**FT**	**ME 138**	**60%**	**20%**	**20%**	**100%**
Ali Hussein Alwan	**FT**	**ME 343+ME 237**	**70%**	**20%**	**10%**	**100%**
Sara Jassim Mohammed	**FT**	**ME 122**	**70%**	**20%**	**10%**	**100%**
Shaimaa kadim mohsen	**FT**	**ME 122**	**70%**	**20%**	**10%**	**100%**

1. FT = Full Time Faculty or PT = Part Time Faculty, at the institution

2. For the academic year for which the Self-Study Report is being prepared.

3. Program activity distribution should be in percent of effort in the program and should total 100%.

4. Indicate sabbatical leave, etc., under "Other."

5. Out of the total time employed at the institution.

Table (6-4) General Mechanical Engineering Branch Area Committees

No.	Title	Name	Specialty
1	Prof. Dr.	**Shaker Sakran Hassan**	**Applied**
2	Asst. Prof. Dr.	**Mufaq Ali Tawfeq**	
3	Asst. Prof. Dr.	**Sadiq Hussain Bakhi**	
4	Lecturer Dr.	**Ali Raad Hassan**	
5	Lecturer Dr.	**Ihsan A .Hussain Baqer**	
6	Lecturer Dr.	**Mohanad Yousuf Hanna**	
7	Asst. Lecturer	**Ali Hussein Alwan**	
8	Asst. Lecturer	**Orhan Sabah Abdullah**	
9	Lecturer Dr.	**Ibrahem mousa hassan**	
10	Lecturer.	**Najmuldeen Yousif Mahmood**	
11	Asst. Lecturer	**Shaimaa Hilal Kamel**	
12	Asst. Prof. Dr.	**Sattar J. Habeeb**	**Refractories**
13	Lecturer Dr.	**Ali Lafta kaed**	
14	Lecturer Dr.	**Kadem Ali Hassan**	
15	Lecturer Dr.	**Sahra Hassan**	
16	Lecturer Dr.	**Wisam Abed Kattea**	
17	Asst. Prof. Dr.	**Samir Ali Amin**	**Production Engineering**
18	Asst. Prof. Dr.	**Sadiq Jafar Azez**	
19	Prof. Dr.	**Ahlam Taha Hussein**	**Other**
20	Asst. Lecturer	**Shaimaa kadim mohsen**	
21	Asst. Lecturer	**Sara Jassim Mohammed**	

CRITERION 7. FACILITIES[1]

FACILITIES (Offices, Classrooms and Laboratories)

7.1 Buildings, Laboratories and Educational Facilities

7.1.1 Buildings

Mechanical engineering department has two buildings because it is one of the largest engineering departments at the University of Technology and they are:

• Building (M) (Main): It is the headquarter of the main department, which is still under rehabilitation.

• Building (B) (Branch): It is attached to the department building which now has become the headquarter of the main department.

Each building contains three floors and a basement that includes the faculty offices, classroom, laboratories and the headquarters of the committees, units and branches receptions civil defense officers and stores, while the offices of the heads of branches, a library of Graduate Studies, the Internet unit and free books store and ateliers are being distributed on two buildings except the presidency of the department located in the main building. Each branch of the four ones of engineering specialties contained in the engineering department includes coordinators, secretarial and some of faculty members

The department gives more attention to services facilities through maintenance unit that follows up all the department belongings including the elevator which contains a reserve battery if the power goes out suddenly , and there are reception and civil defense officers in every building who take responsibility to monitor the building and protect it day and night , as well as there is ongoing perpetuating for health facilities located symmetrically in the building floors(right and left) , as well as providing first aid and essential medicines in the pharmacy in all headquarters of the committees , units, divisions , branches and senior leadership.

The department provides stationery with its supplies and cleaning materials for all laboratories, ateliers and headquarters. There are also a sports arena with an area of 1000 m^2, and a (50) m^2 hall for various activities.

Supplement (7-1) illustrates some of the department pictures and its laboratories and academic halls.

Supplement (7-2) shows contents of the buildings floors M and B

Supplement (7-3) shows the geographical location of University of Technological and department according to GPS data.

And in brief description, we will look to:

• Faculty offices.

• Classrooms.

• Laboratories.

• Library.

Faculty Offices

Faculty offices are located in two buildings (M and B) and each room occupied by teaching one teacher and in some cases (2-3) teachers, so the office spaces are ranging between (20-10) m^2, Supplement (7-2), and these rooms are well furnished carpeted, air-conditioned and equipped with Internet service. In addition to the fact that all teaching staff are provided with a laptop computer and currently more than one teacher is being integrated in a room and quite more than before because of current stability in the attached building until completing the restoration of the main headquarter (A).

Notes:

• Rooms containing 5 faculty offices are allocated for individual with part-time leave (PhD students).

• Room No.115 are for the presidency of the aircraft branch and 114 for its secretary, 217 for the presidency of the mechanic's branch, 216 for its Secretary .303 for the administrative assistant, 302 for its Secretary ,304 for Scientific assistant 305 for its Secretary, 309 for the Administrative Divisions.

To be (75) for the current year after qualifying the third floor of the building (A).

Classrooms

Classrooms are divided into two buildings M and B, including large and small ones, which all have (146) (WIGHT BOARD) and (4) (SMART BOARDS): There are two types of these smart boards:

• E-beam board with a contact pen.

• Key-tab board; this kind of blackboards is very sensitive that should not be writing on or strep. It has a sensor pen biasing charger.

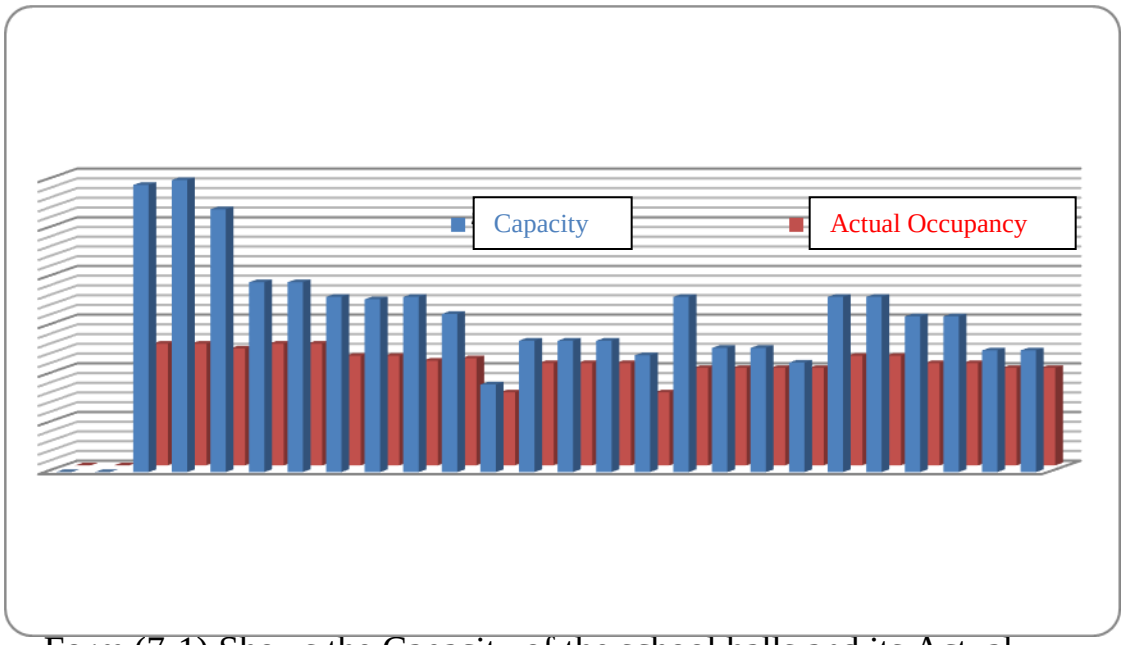
It should be noted that all classrooms are air-conditioned, including the Hall of Graduate Studies and the halls of conferences and seminars, and the latter two also contain integrated and different display devices and their accessories and laptop computer equipped with Internet service.

Ateliers: There are two Ateliers (1 and 2) which are furnished appropriately and enough for students and note that the AutoCAD substance was added to the ateliers along with engineering and mechanical drawing.

(Table 7.1) shows the name of classroom with its space, its capacity and the actual occupancy for 2016-2017.

Table (7.1) Classrooms, its area and capacity.

No.	Hall Name	Area m^2	Capacity During the year 2017-2018	Actual Occupancy During the year 2017-2018
1	M04	154	118	50
2	M05	160	120	50
3	M07	135	108	48
4	M10	94	78	50
5	M13	94	78	50
6	M102	82	72	45
7	M103	80	71	45
8	M104	82	72	43
9	M110	74	65	44
10	M205	40	36	30
11	M206	66	54	42
12	M209	66	54	42
13	M210	66	54	42
14	M307	58	48	30
15	B210	82	72	40
16	B207	62	51	40
17	B209	62	51	40
18	B205	56	45	40
19	B202	82	72	45
20	B201	82	72	45
21	B307	72	64	42
22	B308	72	64	42
23	Atelier1	100	50	40
24	Atelier2	100	50	40



Form (7-1) Shows the Capacity of the school halls and its Actual Occupancy.

Laboratories

There is in the Mechanical engineering department about (26) Laboratories and two workshops distributed in two buildings M and B.

Table (7-2) shows the names of laboratories for each stage and specialization with the capacity and the actual occupancy. As though Supplement (7-4) shows the names of laboratories, size, and number of lab. Devices, themes served by the laboratory for each of them and the needs of laboratory devices.

The lab is being supervised by a faculty member who undertakes the theoretical side while the practical side is under the responsibility of lab engineer but under the supervision of the teacher. The policy in the laboratory imposes the presence of CYCLE for each stage divided the number of students on the basis of (A, B, and C) aggregates, each group enters given lab in a week and is given the theoretical part of the experience, and most of which is complementary to the theoretical lectures in the stage curriculum and specialization in which the student then has made the practical part, taken readings and performed calculations with a model of the solution and draw diagrams and discussed them. The number of given tests for each lab rang from (7-4) experiment during the school year and (8-12) exercise for programming and computers laboratories. There is a comprehensive examination on all tests and exercises at the end of the school year and the degree of the laboratory is the rate of total degrees of reporting and discussing all experiments.

It should be noted that the laboratory devices are not only old, but also the good ones return back to eighties. The urgently acceleration of the technological processions has created devices more sophisticated and efficient at the lowest cost and power consumption which include the possibility of compatibility with other devices.

There is also models in some laboratories that increase the knowledge of students, for example: (cross-sections for some parts of the engines. laboratory devices are maintained by the maintenance unit of the department and there are new devices added to the preliminary and graded studies laboratories during the past three years. purchased huge Steam Boiler was purchased for steam laboratories and steam stations during the academic year 2011-2010. It should be noted also that there is guidance stated that graduation projects and graduate studies should have carried ideas for devices to be used in laboratories and testing. There are cultural relations with other Iraqi universities, whether governmental or civil or institutions of higher education and scientific research to give assistance to their students and researchers in using these laboratories. Modern lab devices have been bought for the different department disciplines and is being planned to buy more during the coming years until renovating all laboratories with academic apparatus similar to those in the world universities.

Also the committees, divisions, units and some laboratories are provided with a computer desktop or laptop.

Table (7.2) illustrates lab. Names and their capacity and the actual occupancy for each stage.

	Lab-Name	stage	topics served by laboratory	specializations	area (m^2)	capacity during 2017-2018	actual occupancy during 2017-2018
1	Mechanics	First	Mechanic I. II	all	41	15	14
2	Heat (1)	First	Heat	all	42	14	14
3	Electricity	First	Electricity	all	20	14	14
4	Heat (2)	second	Heat (2)	all	300	14	10
5	Materials resistance	second	Resistance	all	41	15	10
6	Fluid (1)	second	Fluids	all	198	15	10
7	Conditioning	third and fourth	Conditioning	General Conditioning	65	15	12
8	Combustion engines	third	Combustion	All except aircrafts	145	10	12
9	programming	first	Fortran + CAD	All with drawing	30	12	12
10	Theory of Machines	third	ALL machines except auto	all	55	12	10
11	heat transfer	third	heat transfer	all	52	10	10
12	Fluids (2)	third	Fluids	all	198	15	10
13	control	fourth	control	all	45	10	11
14	vibrations	fourth	vibrations	All except Auto	45	10	11
15	gases	Third and fourth	Dynamics gases	Aircraft and general	36	12	11
16	stations	fourth	steam stations	general	300	15	**12**
17	programmable 4	fourth	CAE	all	36	12	12
18	air conditioning workshop	fourth		air conditioning	-	10	12
19	freezing	fourth	freezing	air conditioning	65	15	12
20	aircraft engines	fourth	pay	aircrafts	36	10	9
12	Aircraft Maintenance	fourth	maintenance	Aircrafts	36	10	9
22	Dynamic plane	fourth	Dynamic	Aircrafts	36	12	9
23	Combustion processes	fourth	Combustion processes	All except aircrafts	145	10	9
24	Theory of vehicles	third	Theory of vehicles	Auto	11	12	8
25	Programming 3	third	Solid work+ analyzes	General mechanics	38	12	12
26	Programming	second	CAD+Matlab	All except drawing	-	12	12
27	Technology equipment	Third forth	Technology equipment	all	35	25	25
28	Laboratory workshop graduate studies	M.Sc. - Ph.D.	Topics pertaining Engineering Branches	all	30	10	4

Library

Library of department is the oldest scientific library in the University of Technology which was established since the founding of the Institute of Higher Industry in 1960 and the department in equipment and machines engineering, also has special Hall in the Central Library of the University of Technology, as well as IVSL library, and the modern electronic library in which work has been started since 2007 - 2006, in addition to free-book store.

- Department Library

The area of this library is (100) m^2 and is used by students of graduated and preliminary studies and faculty. It has (26) racks of different sizes with two-and three suites which include many titles of books in Arabic and English, besides thesis, magazines and periodicals. The library is managed by three specialized employees using a database and it contains one reading room furnished and air-conditioned. (Table 7-3) shows the number of books, magazines, periodicals, thesis and CDs.

Table (7-3) shows the number of books, magazines, periodicals, thesis and CDs

CD		Thesis, MSc. – Ph.D.		Periodicals		Magazines		Total number of books	
No.	Type	No.	Type	No.	Type	No.	Type	No.	Type
4	**4**	**769**	**37**	**587**	**587**	**-**	**-**	**4325**	**2203**
During the year 2016-2017									
foreign	Arabic	foreign	Arabic	foreign	Arabic	foreign	Arabic	foreign	Arabic
-	-	**5**	**8**	1	10	1	5	113	-

• Type means (one title) and the number refers to (number of copies per title).
• The total number of type is (2805) and the number (5659) includes (267) Arabic Book, (2078) English book. The number of periodicals is (454) Arabic and (133) English.
• The number of masters and doctoral thesis is (756) for both of the type and number added during the current academic year.
• Library Services are dedicated to the employees of the department and the university and students of preliminary and graduate studies.

- Central Library

The University of Technology has a large building related to the Central Library composed of 4 floors each floor boasts two halls and each of which covers an area of approximately 400 square meters. It depends on an electronic system - League decimal catalogs – for indexes, titles, authors, publishing houses and the number of prints.

This library Includes suites relating to the scientific and engineering branches such as a special suite for the mechanical engineering department which has (1600) Arabic Book, (3077) English, (988) thesis and (250) titles of periodicals and magazines. These books can be borrowed by preliminary & graduated studies students and the employees equally through using participation identities for limited period.

- IVSL Library

It is an electronic library dedicated to graduate students, faculty and researcher s and managed by IT center through allocating a user name and password through which the researcher can enter this library and take advantage of their sources.

- Electronic Library

After collecting books, research, Periodicals and thesis in an independent external storage unit, the contents are arranged and renamed to groups, each group inside a file to facilitate the search process as in the following way:

- Putting all the engineering and scientific books into portfolio.
- Putting all thesis within the thesis portfolio.
- Putting all the images within the images portfolio.
- Putting all the engineering programs within the programs portfolio.
- Putting all the scientific conferences within the conferences portfolio.
- Putting all research within the research portfolio.

Scientific journals have been kept within the research file, taking into account putting the name of the magazine and the date of issuance on each file.

- Free Books Store

It Includes textbooks for all stages and specializations and has an area of about (125) m^2 and (30) racks holding (2090) books, most of them are in good condition and the rest is in a lower condition than those. Table (7-4) and (7-5) show the ratio of the number of books to under-post graduates, titles and books numbers. The books will be distributed free of charge at the beginning of the school year and being received from the students to be kept at the book store before announcing the final results. The percentage of free books distribution for education at the current year is 85% which is the same as the last year. The distribution of books to the students of the second round is being done in the light of their final results and restored them before announcing the results of the second round.

Table (7-4) number of students, used books and their rate

	Students No.	Type of study	Used books No.	ratio
1	**720**	Preliminary	**2090**	**%75**
2	**414**	top	**5659**	**%85**

Table (7-5) Number of titles and books

Copies No.		Titles No.	
English	Arabic	**English**	Arabic
1010	**1080**	**20**	**12**
2090		**32**	

- Internet Unit

At the University of Technology, there is a Center of Information and Communications Technology which provides all its scientific departments and research centers with internet service (WIRELSS NETWORK) by distributor (ROUTERS). Buildings stories and the offices of the teaching staff are supplied with lines, where there is one system in the department which includes (96) lines.

There are (204) desktop computers, (115) laptops, (107) of which are for faculty as well as there are (91) desktop computers, (15) laptops used for administrative and service purposes– administrators, technicians, scattered (2) Laptops, (204) office Computers (41) Computers added this year, as well as (113) desktop computers dedicated for programming laboratories.

Table (7-6) shows the number of computer devices of under-post graduates and their ratio.

No.	Students No.	Type of study	computers No.	ratio
1	720	Preliminary	113	%100
2	144	top	19 for teachers and Internet unit	%100

The internet unit was established in 2004 to be distinct gate for the mechanical engineering department. This service was being provided in limited way at the beginning where there were ten computers, then this service was increased gradually to include (wireless) service for all teachers to provide their services to employees and students (under graduate, post-graduate, researchers). This unit provides other services, including:

1 - Helping students in the process of search and getting research and reports.
2 - Teaching students to use computer and the questions relating to programs and installation.
3 - Providing printing service for research and reports on papers.
4 – Providing research registration service on discs and copying CD.
5 – Providing scanner service for papers.
6 - Providing Internet service to students.
7 – Providing (wireless) service for all department teachers.
8 - Helping teachers and employees through providing computers maintenance and installation of software.
9 - Providing email service to the department which provides communication between the connected party from inside and outside Iraq, and the presidency of the department as well as responding all queries and answers.

- Department Website

Website was set up in 2007 and was developed gradually.
Through this website, can do the following functions:

1- Publishing the latest news and activities of department.
2- Defining cadre of the department and identify its branches.
3- Identifying the department curriculum of the four branches.
4- Disseminating lessons lectures on the department site.
5- Disseminating questions of previous years.
6- Disseminating rapid news and announcements on the site.
7- Informing graduates on dates of receiving their graduation documents in the event of readiness.
8- Disseminating various activities of the department (sessions, conferences, seminars and discussions of graduate students).
9- Disseminating sports activities of the department.

Supplement (6-5) represents the image of the website of the department.

- Printing and Discs Recording

This service includes providing service of copying reports and research as well as helping in the organizing of reports, research and projects besides teaching them how to print, apply orders, typeset and train.

- Computer Labs

These labs develop, sustain and maintain all computers of department including desktops, laptops and private laboratories in addition to installing the educational programs for students and following up the updates from time to time.

- Online in the arena of university

- Students Utilize the Internet in the field of scientific research, reports, and programs that contribute to raising their levels.
- Students Utilize the Internet for continuing and communicating inside and outside the country.

Conference Room

The General Mechanical Engineering Branch conference room is used as a faculty meeting room, an interview room and a classroom with modern data show and screens, which is an area (200 m^2) and capacity (100) people

Conclusion:

- The department have two buildings M and B; each one has crypt and (4) floors.
- The total area of the two buildings is (3000) m^2.
- There are 40 rooms used as offices for teachers.
- The total area of the offices are (320) m^2 range from smaller space (5) m^2 and the bigger area of 10 m^2.
- There are (22) classrooms ranging in size from (100) m2, and (250) m^2 and the total area is (2400) m^2.
- Actual Occupancy of classrooms is less than their capacity.
- There are three halls for sessions, conferences and thesis discussion, and the four are dictated for the Council of the department which distributed as follows: (three halls in the building M and its space is (525) m^2 and one in the building B and its area is (100) m^2.
- There are (26) laboratories for 4 stages and their specialties and 2 workshops for the initial and graduate.
- M and B buildings are furnished, air-conditioned, equipped with internet services.
- There is an internal phone network in the department that allows communicating with, laboratories divisions and units by the senior leadership of the department reached to about (12).
- There is (180) computers distributed among programming labs, Internet unit, faculty offices and the unites, division of the high command headquarters and the distributor.
- Wireless LAN Network and (7) ROUTERS and (86) lines.
- (85) Laser printers, (20) colored
- (1600) CD players.
- (550) FLASH RAM.
- (16) copying devices.
- (12) Paper wearing-out devices.
- (70) Bulletin boards distributed throughout the department.
- (62) Large and small conditioners, (4) package conditioners and (76) Split
- (40) Water coolers and (76) refrigerators.
- Pharmacy that contains a first aids and some important medicines (5).
- (146) White Boards of various sizes.
- (9) Vacuum Cleaners.
- (54) Electric heaters and (70) oil heaters.
- Wall clocks.
- (29) Water heaters, (47) air distributors, (16) Mirrors, (8) Cooks, laundry for laboratories, (3) kitchens, (44) heaters and (35) gas bottles.
- (6) Different generators.

- (60) Fire extinguishers and announcements pertaining civil defense published in all floors and courtyards of the department.
- (52) Tanks for storing files.
- (110) iron lockers.
- (13) Monitors (DATA SHOW), (4) smart blackboard, (8) TV, (5) Satellites, (3) screens (LCD) and (28) Over Head.
- (2) Emergency stairs.
- (99) Drawing boards.
- (110) Laptop.
- (6) Scanners.
- (270) ceiling fans, (47) vertical fans and (19) wall fans.
- (56) Shelves, (448) fixed and Plastic chairs, (166) stools, (61) swivel chairs, (180) curtains, (15) carpets, (302) various tables and (20) glazed offices.

Books or subscriptions, the library's systems for locating and obtaining electronic information, and any other library services relevant to the needs of the program.

CRITERION 8. INSTITUTIONAL SUPPORT

A. *Leadership*

The senior leadership of the Department of Mechanical Engineering Department of the Council consists of:

•Head of Department.
• Associate Administrator of the department head.
• Associate scientific head of the department.
• Chairman of the General Mechanics branch.
• Chairman of air-conditioning and freezing branch.
• Head of Automotive Engineering Branch.
• Chairman of aircraft engineering branch.
• Representative of the teachers' union.

B. *Program Budget and Financial Support*

Department of Mechanical Engineering departments like the rest of the budget set by the presidency of the University of Technology, which in turn determine by the Ministry of Higher Education and Scientific Research. Which consist of the following:

• General Budget
• Higher Education Fund
• Evening budget / previously
• Grants and donations
• Expense of private / graduate
•Internet services
• Records of revenues
• Contributions to the Advisory Office
• Contributions in state institutions
• Private sector and civil

C. *Staffing*

The methods used to retain and train staff. And/or Faculty development and professional staff activities, including: attending seminars, lectures, and participate in training workshops and conferences and professional activities of professional writing, and review activities, and make new and innovative research, and training programs inside and outside Iraq include:

1. Study leave (outside the country) is a program that allows for faculty members who have not received a doctorate for a chance to study abroad degree. The Ministry provides tuition, travel, and a monthly stipend. Well also, it includes participation through temporary contracts with the same benefits. Many of the teachers have participated in this program successfully.

2. Center for Continuing Education Center offers professional development and training sessions for faculty members. It requires all new faculty members to obtain a certificate of participation for training in the first year of operation.
3. Sabbatical: leave the university supports the professional faculty (full-time) activity after five years of service. Some faculty members have benefited from this opportunity.
4. Training of teaching staffs out of Iraq in a prestigious international university, according to the Department of Research and Development in the Ministry of Higher Education and Scientific Research Program.

D. Faculty Hiring and Retention

Any process including Hiring or Retention is the responsibility of the presidency of the university in cooperation with the Department

E. Support of Faculty Professional Development

Widened the attention this year to the question of which educational guidance systems so that each of all the stages and terms of reference and an educational guide people.

We are dealing with students and provide advice and guidance to them by the Committee on Student Affairs in the Department of Mechanical Engineering. This Committee is composed of some faculty members and is responsible for advising students and help students on their professional development.

The number of meetings with faculty and with students outside lectures hold times to look at the scientific affairs and university research activities. In addition, it offers advice to students by all faculty members on the basis of experience, guidance and willingly.

PROGRAM CRITERIA

The main goals of general mechanical engineering branch since the beginning of its foundation an extension of the objectives of the University of Technology in the delivery of his message to the scientific community. Branch has a number of strategic goals, represented by:

1. Preparation of engineering staffs in the specialty of mechanical engineering has a responsibility to build a home and participate in the overall renaissance in line with the needs of the country and the preparation of cultured generation armed with science and adopt a sound basis to bring about radical changes and puts scientific knowledge and scientific way of thinking and analysis in the country's objectives service.
2. instill moral values in engineering for the birth of a new generation and the preparation of an alternative future leaders in the disciplines of engineering of mechanical in addition to instill humanitarian and Islamic values. In addition, work to strengthen the University of Technology's position as the center of radiation creatively to deepen the culture of authentic social values.
3. Work on deepening the balance between the theoretical progress of science and applied aspects between them, as well as focus on the introduction of modern methods of learning system that increase the students' ability to design, creativity and innovation. Raise the level of graduate and diversification and providing various accessories and commensurate with the needs of the country. Moreover, work to link graduate interim needs to plan for sustainable development of the country and respond to the development of appropriate scientific and practical solutions to problems faced by the industrial sector or the development of proposals and controls her.

Program Objective:

The basic objective of the education program in general mechanical engineering branch which is compatible with the goals of the University of Technology is to instill and install a solid scientific and practical knowledge in the engineering graduate's basis in addition to the development of the manual and intellectual skills necessary in their professional lives. It was discussed tutorial targets (PEOs) of the section and on an ongoing basis with most of the faculty members in several meetings.

The first objective

Provide a solid foundation for the students in the discipline department and design methodologies by focusing on the application of mathematical, scientific and engineering principles.

The second objective

Given the exceptional circumstances faced by the country necessitated the student's interest in the matter and rehabilitated psychologically and perseverance in achieving the ambition that is the basis of all new through actions within the context of the work in the department. And to provide a sound knowledge of the students from the academic and professional practices in the relevant jurisdiction of mechanical engineering, as well as awareness of the social implications of technologies in mechanical engineering.

The third objective

It focuses on the development and improvement of educational and rehabilitation activities in the department. And it is linked to the importance of applied research and

supplementing the theoretical side to side, and the importance of knowledge for students complete the requirements and sustain through their participation in various aspects of applied both inside and outside the university in the centers and factories and laboratories. In addition, increase the portability of learning, education and skills of the students and work to raise the spirit of development and their creativity.

Program Checkup:

The auditing process and evaluation of the program's educational department through the following channels:

1. Study and evaluation of the student.
2. Discuss the faculty.
3. Study and evaluation of the graduates.
4. Study advice and the opinion of the labor market (industry).
5. Viewing similar experiences and debate in the local and international universities.

And the evaluation of the objectives of the educational program of the Department of process continuously and informally whenever possible through many channels, such as views and questionnaires graduates, the views of faculty and student members and the views of experts from employers and industry ... etc., starting from previous years, as it has been conducting systematic documentation each of these views and questionnaires and then analyze and evaluate this data by the administration and faculty members to determine whether there was a need for changes in the support tutorial.

Signature Attesting to Compliance

By signing below, I attest to the following:

That _____ (*Name of the program(s)*) has conducted an honest assessment of compliance and has provided a complete and accurate disclosure of timely information regarding compliance with ABET's *Criteria for Accrediting Engineering Programs* to include the General Criteria and any applicable Program Criteria, and the ABET *Accreditation Policy and Procedure Manual.*

_____

Dean's Name (As indicated on the RFE)

_____ _____

Signature **Date**