ABET
Self-Study Report

for

Mechanics Engineering of Power Plants 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

Table of Contents

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:

Since the founding of the university in 1975 under the name of the Industrial Institute and until now, the University of Technology has been and is still characterized by high specificity for the rest of the Iraqi universities, as a specialized engineering science university and is the only specialist in Iraq's universities. Since the date of its establishment ,as a university specializing in this area , working to supplement the labor market and the state departments of scientific and engineering cadre of the undergraduate studies and postgraduate studies and the university will continue to work and walk in this direction until reaching the highest scientific and administrative developments .

About Mechanics Engineering of Power Plants:

Mechanical Engineering of Power Plants is considered as the newest branch in Mechanical Engineering Department in University of Technology since it was established in 2015. It is one of the important branches due to the growing need of the labor market for engineers specialized in the field of power generation plants.

This branch aims to prepare a mechanical engineer specialized in the management, operation and maintenance for power plant since this sector has an increasing importance in Iraq and to keep pace with the great expansion witnessed by the production of electrical energy sector of various types: thermal, gas turbine, diesel and water resources plants, which requires supplement this sector with specialists engineers capable of accommodating with advanced technology.

C. Options

The ME program grants only one degree, the Bachelor of Science in Mechanical Engineering/ Mechanics Engineering of Power Plants.

D. Organizational Structure

Administrative structure from lower to upper administration: Head of Branch (Mechanical Engineering of Power Plants Program), 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.

F.Program Locations

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

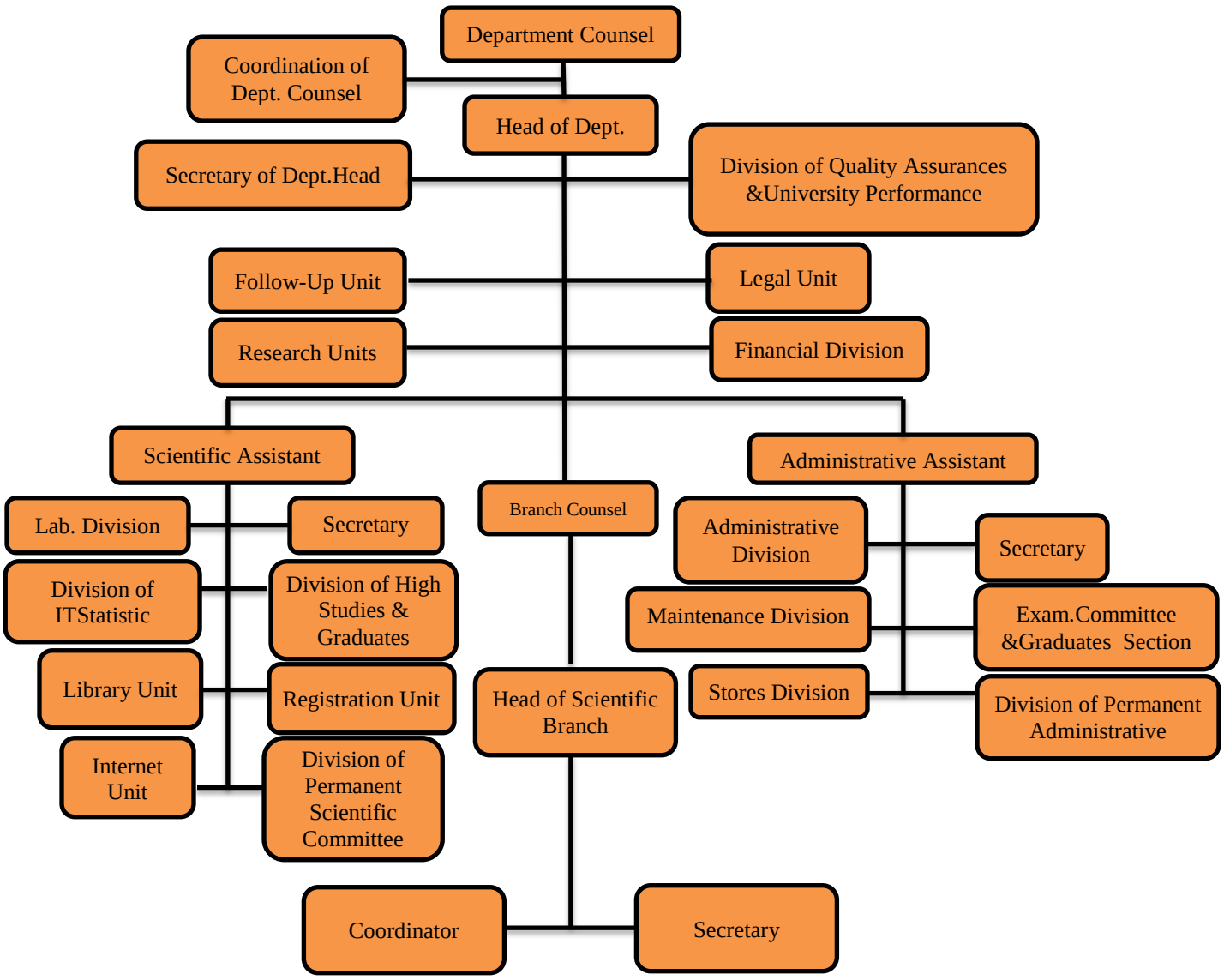
G.Deficiencies, Weaknesses or Concerns from Previous Evaluation(s) and the Action Taken to Address Them

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

H. Joint Accreditation

The Power Plants Mechanics Engineering program is jointly accredited by Mechanical Engineeringcriteria, but it is not seeking joint accreditation by more than one commission.

Organizational Structure



CRITERION 1. STUDENTS

A. Student Admissions

1. To be accepted for an undergraduate degree in Mechanical Engineering Department, applicants must hold the official Iraqi Secondary School Certificate. 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 nationalityand born on 1996 and up.
B. Having a certificate from an Iraqi secondary school authorized from the Ministry of Education.
C. Having 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. Students are Accepted and distributed at Engineering Departments in the University of Technology, including Mechanical Engineering Department, according to the capacity of the department and the average rates of the applicants and their desires. The acceptance plane is controlled by the Ministry of Higher Education and Scientific Research. The department capacity plan in the past three years was (150) students.
G. Admission 10% of the top graduates of Technical Institutes.
H. The new student must submit the required documents within a specified period.
I. A new student graduated from a high school outside of Iraq has to complete twelve years of study (primary and secondary) from an accredited school. He also has to provide an equal certificate from the Iraqi Ministry of Education.

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.

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

Table (1.1) Numbers and rates of enrolled students.

Academic year	Admission grades		New students No.	Graduates No.
	Minimum average	Moderate average		
2015-2016	89.5	90	32	24
2016-2017	89	90	30	25

2017-2018	88.5	90	42	35

B. Evaluating Student Performance

The Evaluation process and assessment measures are as follows:

Subject with lab.	Mid-term15%	10% evaluation+ 5% quiz	10% lab. evaluation	Final Exam 60%	Final Grade 100%
Subject without lab.	Mid-term15%	10% evaluation+ 5% quiz	N/A	Final Exam 70%	Final Grade 100%
Engineering Drawing + Descriptive Geometry + CAD	Mid-term10% Mid-term 5% Mid-term 5%	15% evaluation 5% evaluation 10% evaluation		Final Exam 25% Final Exam 10% Final Exam 15%	Final Grade 100%
Programming,	Mid-term 20%	Lab. Activity 15%	15% lab. exam	Final Exam 50%	Final Grade 100%

Students who were not able to attend the relevant final examination are allowed to take a second attempt exam. Students who were not able to attend the relevant second attempt examination because of conditions out of their control (due to security and violence issues) are allowed to take a third attempt exam (only by the permission of Ministry of Higher Education & Scientific Research). If the student fails to pass the last attempt (third attempt) Students who were not able to attend the relevant final examination are allowed to take a second attempt exam. Students who were not able to attend the relevant second attempt examination because of conditions out of their control (due to security and violence issues) are allowed to take a third attempt exam (only by the permission of Ministry of Higher Education & Scientific Research). If the student fails to pass the last attempt (third attempt) and fails to get 50%, he/she will be considered as (FAIL) in that course. The student allows to take two failed courses to the next level, but if he/she failed in more than two courses, the student has to repeat the academic year. Fail to succeed two successive years, he/she dismiss from the university.

C. 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 analogues. 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.

1. The president of the university has the authority to transfer students (either those who pass or not pass the final exams) , excepted the first and last year students , to the corresponding departments and branches in another university according to the absorptive capacity after obtaining no objection 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 of scientific titles of the faculty have the right to move between the branches of the colleges and departments except of those that have a separate code.

7.Students in community (private) colleges who are pass the final exams with first grade, andat least have a (very good) grade, have the right to move to the corresponding dept.in the public universities.

8.Transfer or hosting students to and from the Kurdistan region according to a trade - off form to the corresponding departments.

9.Acceptance of foreign students (Iraqi and non-Iraqi) from outside Iraq by the ministry of higher education and scientific researches roles.

For more information visit link http://www.moher.edu.iq/

D. Advising and Career Guidance

1. Hold a meeting of mentors and faculty members 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 tostudents.
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.

E. Work in Lieu of Courses

N/A

F. Graduation Requirements

The graduation requirements for the initial study is complete theoretical and practical study for four years and by units planned and complete the summer training study plan during the study period and the completion of a graduation project to link the teaching curriculum decision.

G. Transcripts of Recent Graduates

This Committee for the follow-up graduates by holding seminars for them to follow their workplaces and their opinions through questionnaires distributed to them and that the website of the department.

CRITERION 2. PROGRAM EDUCATIONAL OBJECTIVES

A. Mission Statement

Mission Statement of the University of Technology:

The mission statement of the University of Technology is represented by reproducing of new channels and paths in the undergraduate and postgraduate engineering 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.

Mission Statement of the Mechanical Engineering Department:

The mission statement of the Mechanical Engineering Department (included the Mechanical Engineering of Power Plants)is:

1. Prepare engineers who had bachelor's degree in mechanical engineering sciences according to society's need and keep going with technical and scientific, through upgrading teaching staff, laboratories, libraries and curriculum.
2. Developing study quantitatively and qualitatively in accordance with the mission of the University of Technology.http://www.uotechnology.edu.iq/

B. Program Educational Objectives

The program educational objectives of Mechanical Engineering of Power Plants are:

Objective 1: Preparing engineers efficiently specialists in the field of Mechanical Engineering of Power Plants and able to develop their skills in the fields of engineering knowledge.

Objective 2: Apply engineering knowledge and skills to make positive impact on society through employment in industry, advanced study, and/or public services.

Objective 3: Mechanical Engineering of Power Plants graduates as professionals in the various fields of energy engineering and known professional and ethical responsibilities in implementing sustainable engineering solutions.

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

The program educational objectives of the Mechanical Engineering of Power Plants branch are consistent with the mission of the branch. 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 Mechanical Engineering of Power Plants 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) **Branch members:**

Branch 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 Branch 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 Branch, 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 of Power Plants Branch 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 EREE 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 EREE that ensures the department's continuous commitment to anticipate and surpass new academic challenges set forth by an evolving industry. The board experts are:

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 - CentralRegion	General Mechanical
2	Senior Engineer	EmadKhanim 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	QasimSalih Mahdi	College of Engineering – University ofAl-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	IhsanEzetSalih	Iraqi Airways	Aircrafts
10	Military Dean Engineer	Sabah Adem Mahmoud	Air Force Leadership - Director of Air Engineering	Aircrafts
11	Dr. Engineer	Raouf Mohamed RadieAlmosawi	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 ofDoudg, 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	LamaanSabriMajly	Directorate of Electricity Production - Central Region	Power Plants
16	Chief Engineer	Alaa Abed AljebarBedin	Ministry of Electricity –Training and Energy ResearchesDepartment	Power Plants
17	Consultant Engineer	Adel Bader Alryahi	Ministry of Planning –Bureau of Ministry Deputy	Power Plants
18	Engineer	MazinKhadim Mohamed	Al-Kudis Thermal Generating Station	Power Plants

E. Program Educational Objectives

The Energy and Renewable Energies Engineering program Educational Objectives have been reviewed according to the need of labor market and rapid technology development in Energy and Renewable Energies 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 energy and renewable energies engineering disciplines;
2. Contribute to society and the profession.
3. Engage in life-long learning to advance professionally through continuing education and training.
4. Succeeding graduate studies in energy and renewable energies engineering or a related field if pursued.

CRITERION 3. STUDENT OUTCOMES

A. Student Outcomes

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

a. The ability to apply knowledge in mathematics, science and engineering.
b. The ability to design and conduct experiments, as well as analyze and interpret data.
c. The ability to design a system, component, or process to meet desired needs within realistic constraints such as economic, environmental, social, political and ethical, as well as health and safety, manufacturability, and sustainability.
d. The ability to work in multi-disciplinary teams.
e. The ability to identify, formulates, and solve engineering problems.
f. An understanding of professional and ethical responsibility.
g. The ability to communicate effectively.
h. The broad education necessary to understand the impact of engineering solutions in a global, economic, environmental, and societal context.
i. Recognition of the need for, and an ability to engage in life-long learning.
j. Knowledge of contemporary issues.
k. An ability to use the techniques, skills, and modern engineering tools necessary for engineering practice.

the*Student Outcomes* are properly linked to our *Program Educational Objectives*

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 EREE 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.
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 EREE Program will be trained to achieve the Student Outcomes throughout the coursework. The ABET syllabi for the required courses are contained in the Appendix B. 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.

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

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

Curriculum		Student Outcomes (SOs)										
Code	Name	a	b	c	d	e	f	g	h	i	j	k
First Class (1st Course)												
ME111-1	Human Rights & Democracy						•					
ME122-1	Programming I	•				•						•
ME123-1	Mathematics I	•				•						
ME194-1	Eng. Drawing &Descriptive Geometry	•	•		•					•		•
ME145-1	Workshops I				•		•					•
ME136-1	Thermodynamics I	•	•			•						
ME197-1	Mechanics I	•				•						
First Class (2nd Course)												
ME191-2	English Language and Technical Technology									•		
ME192-2	Mathematics II	•			•	•						
ME143-2	Workshops II				•		•					•
ME134-2	Thermodynamics II	•	•			•						
ME135-2	Materials Science and Technology			•		•					•	
ME196-2	Mechanics II	•	•			•						•
ME197-2	Electrical Engineering	•		•		•						•
Second Class (1st Course)												
ME221-1	Mathematics III	•	•			•						•
ME292-1	Mechanical Drawing and CAD	•		•		•						•
ME243-1	Strength of Materials I	•				•						
ME294-1	Fluid Mechanics I	•	•		•					•		•
ME295-1	Thermodynamics III	•	•			•						
ME296-1	Manufacturing processes	•	•			•						
ME297-1	Mechanics III	•	•			•						
Second Class (2nd Course)												
ME221-2	Mathematics IV	•	•	•								•
ME292-2	Power Plant Cycles	•	•			•						
ME243-2	Strength of MaterialsII	•				•						
ME294-2	Fluid Mechanics II	•	•			•						
ME295-2	Electronics and Integrated Circuits	•	•			•						
ME226-2	Programming II	•	•			•						
ME297-2	Fuels and Combustion Processes	•				•						

Third Class (1st Course)												
ME391-1	Gas Turbines and Compressors	•				•			•		•	•
ME392-1	Heat Transfer I	•	•			•						
ME393-1	Theory of Machines	•	•									
ME394-1	I.C. Engines	•				•						•
ME395-1	Electrical Power and Machines	•	•		•	•						
ME396-1	Mechanical Design I	•		•	•	•	•	•				
ME327-1	Numerical Analysis	•				•						
Third Class (2nd Course)												
ME391-2	Steam Turbines	•				•			•			
ME392-2	Heat Transfer II	•	•			•						
ME393-2	Vibration	•	•	•								
ME394-2	Hydraulic Power Plants	•			•			•				•
ME395-2	Microprocessor and Microcontrollers	•				•					•	•
ME396-2	Mechanical Design II	•		•	•	•	•	•				
ME397-2	Steam Generators	•	•			•					•	

ME: Mechanical Engineering

CRITERION 4. CONTINUOUS IMPROVEMENT

The assessment and evaluation process of the Mechanical Engineering of Power Plants (MEPP) 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 EREE curriculum and also used to revise and update the PEOs and SOs as needed. It is noted that the EREE faculty and Industrial Advisory Council (IAC) play an important role in the annual review and assessment process.

A. Program Educational Objectives

The MEPP 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 ERE Engineering are to produce graduates who (during the first several years following graduation):

Objective 1: Preparing engineers efficiently specialists in the field of Mechanical Engineering of Power Plants and able to develop their skills in the fields of engineering knowledge.

Objective 2: Apply engineering knowledge and skills to make positive impact on society through employment in industry, advanced study, and/or public services.

Objective 3: Mechanical Engineering of Power Plants graduates as professionals in the various fields of energy engineering and known professional and ethical responsibilities in implementing sustainable engineering solutions.

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 MEPP ABET Coordinator oversees all the assessment process while the MEPP Undergraduate Committee discuss the assessment results and recommend the possible actions for improvement to the MEPP 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 MEPP 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 MEPP courses, our students will be trained to achieve the SOs. The assessment results for the 2015-2016 course assessments are summarized below in Tables 4.2, the formally pass grade is 50% for all courses, and this was set by Ministry. 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.

Table 4-1 Contribution of Required Courses to Student Outcomes

Curriculum		**Student Outcomes (SOs)**										
Code	Name	a	b	c	d	e	f	g	h	i	j	k
First Class (1st Course)												
ME111-1	Human Rights & Democracy						•					
ME122-1	Programming I	•				•						•
ME123-1	Mathematics I	•				•						
ME194-1	Eng. Drawing &Descriptive Geometry	•	•		•					•		•
ME145-1	Workshops I				•		•					•
ME136-1	Thermodynamics I	•	•			•						
ME197-1	Mechanics I	•				•						
First Class (2nd Course)												
ME191-2	English Language and Technical Technology									•		
ME192-2	Mathematics II	•			•	•						
ME143-2	Workshops II				•		•					•
ME134-2	Thermodynamics II	•	•			•						
ME135-2	Materials Science and Technology			•		•						
ME196-2	Mechanics II	•	•			•						•
ME197-2	Electrical Engineering	•		•		•						•
Second Class (1st Course)												
ME221-1	Mathematics III	•				•						
ME292-1	Mechanical Drawing and CAD	•	•		•					•		•
ME243-1	Strength of Materials I	•	•			•						
ME294-1	Fluid Mechanics I	•	•			•						
ME295-1	Thermodynamics III	•	•			•						
ME296-1	Manufacturing processes		•	•								•
ME297-1	Mechanics III	•	•			•						
Second Class (2nd Course)												
ME221-2	Mathematics IV	•				•						
ME292-2	Power Plant Cycles	•	•			•						

ME243-2	Strength of MaterialsII	•	•			•						
ME294-2	Fluid Mechanics II	•	•			•						
ME295-2	Electronics and Integrated Circuits	•				•						
ME226-2	Programming II	•	•			•						
ME297-2	Fuels and Combustion Processes	•				•		•				•
Third Class (1st Course)												
ME391-1	Gas Turbines and Compressors	•				•			•		•	•
ME392-1	Heat Transfer I	•	•			•						
ME393-1	Theory of Machines	•	•									
ME394-1	I.C. Engines	•				•						•
ME395-1	Electrical Power and Machines	•	•		•	•						
ME396-1	Mechanical Design I	•		•	•	•	•	•				
ME327-1	Numerical Analysis	•				•						
Third Class (2nd Course)												
ME391-2	Steam Turbines	•				•			•			
ME392-2	Heat Transfer II	•	•			•						
ME393-2	Vibration	•	•	•								
ME394-2	Hydraulic Power Plants	•			•			•				•

ME395-2	Microprocessor and Microcontrollers	•				•					•	•
ME396-2	Mechanical Design II	•		•	•	•	•	•				
ME397-2	Steam Generators	•	•			•					•	

Table 4.2 Summary of Courses Performance

Courses		Grades of 2015-2016	Grades of 2016-2017	Grades of 2017-2018
ME111-1	Human Rights & Democracy	66.55	67.4	70
ME122-1	Programming I	63	65.3	68.5
ME123-1	Mathematics I	50.6	51.66	59.3
ME194-1	Eng. Drawing &Descriptive Geometry	64.59	65.44	66.4
ME145-1	Workshops I	66.45	66.9	67.8
ME136-1	Thermodynamics I	52.05	53.7	55.6
ME197-1	Mechanics I	58.45	61	62.1
ME191-2	English Language and Technical Technology	71.7	72.22	73
ME192-2	Mathematics II	62.5	64.8	67.3
ME143-2	Workshops II	72.5	71	74
ME134-2	Thermodynamics II	56.45	55.56	57.1
ME135-2	Materials Science and Technology	65.27	64	65
ME196-2	Mechanics II	65.3	67.33	66
ME197-2	Electrical Engineering	70.14	72.12	75
ME221-1	Mathematics III		64.45	66
ME292-1	Mechanical Drawing and CAD		58.05	59.5
ME243-1	Strength of Materials I		56.45	56
ME294-1	Fluid Mechanics I		70.7	71.8
ME295-1	Thermodynamics III		61.5	62.3
ME296-1	Manufacturing processes		69.5	72
ME297-1	Mechanics III		58.45	60
ME221-2	Mathematics IV		69.27	72
ME292-2	Power Plant Cycles		65.3	67
ME243-2	Strength of Materials II		70.14	71.1

ME294-2	Fluid Mechanics II		67.55	68.4
ME295-2	Electronics and Integrated Circuits		64.66	66
ME226-2	Programming II		51.6	55
ME297-2	Fuels and Combustion Processes		64.59	65.3
ME391-1	Gas Turbines and Compressors			66.3
ME392-1	Heat Transfer I			70
ME393-1	Theory of Machines			53.5
ME394-1	I.C. Engines			66.7
ME395-1	Electrical Power and Machines			70.2
ME396-1	Mechanical Design I			64.3
ME327-1	Numerical Analysis			72.1
ME391-2	Steam Turbines			63.8
ME392-2	Heat Transfer II			69.5
ME393-2	Vibration			61.7
ME394-2	Hydraulic Power Plants			67.5
ME395-2	Microprocessor and Microcontrollers			56.3
ME396-2	Mechanical Design II			63.1
ME397-2	Steam Generators			59.1

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.

MEPP Program Educational Objectives (PEOs):

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

1. Successfully practice theMechanical 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 energy and renewable energy engineering or a related field if pursued.

MEPP Student Outcomes (SOs):
Students from the EREE 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 Mechanical Engineering of Power Plants 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 MEPP curriculum is attached after Table 5-1 at the end of this section (Criterion 5.Curriculum).

A.5. Major Components of the Program
The Mechanical Engineering of Power Plants program produces graduates who are prepared to enter the practice of Mechanical Engineering of Power Plants. There are three major components of the program: (1) foundation in the mathematical and basic sciences, (2) engineering topics, and (3) general education.

A.5.1. Mathematics and Basic Sciences
The engineering science fundamentals and engineering design skills are built upon the basic mathematics and physical sciences. The mathematics work begins with a two-course sequence (ME123-1, ME192-2) on differential and integral calculus. The two courses includes 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 geometryare included in this course. With this foundation in mathematics, our students have necessary tools for applications in analysis and design.
ME135-2, 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.

A.5.2. Engineering Topics
The aim of the program is to graduate students capable to work as mechanical engineer in Mechanical Engineering of Power Plants field. The engineering topics are divided into:

1. ME145-1 and ME143-2/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 Courses; ME122-1/Application of Advance Computer (Microprocessors and MATLAB languages).
3. ME149-1/ 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.
4. ME137-1 and ME196-2/ Engineering Mechanics, This unit of study aims to provide theoretical knowledge and principles of statics.
5. ME136-1 and 194-2/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).

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 Energy and Renewable Energy Engineering Program set required courses in the general education component as follows:
ME191-2/ 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.
ME111-1/ Human Rights, 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. Cooperative Education

The EREE Program have 4 weeks training in nearby industries during summer after third 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.7. 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, as listed in Table 5-4. Part 1 includes the courses taught by the MEPP faculty.

Table 5-1 Curriculum

Course (Department, Number, Title) List all courses in the program by term starting with first term of first year and ending with the last term of the final year.	Indicate Whether Course is Required, Elective or a Selected Elective by an R, an E or an SE.[1]	*Subject 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
		Math & Basic Sciences	Eng. Topics	General Education	Other		
ME111-1 Human Rights & Democracy	**R**			**2**		2015-2016	
ME122-1Programming I	**R**			**3**		2015-2016	
ME123-1Mathematics I	**R**	**3**				2015-2016	
ME194-1Engineering Drawing &Descriptive Engineering	**R**		**6**			2015-2016	
ME145-1Workshops I	**R**	**6**				2015-2016	
ME136-1Thermodynamics I	**R**		**5**			2015-2016	
ME137-1Mechanics I	**R**		**3**			2015-2016	
ME191-2 English Language ant Technical Reports	**R**			**2**		2015-2016	
ME192-1 Mathematics II	**R**	**3**				2015-2016	
ME143-1 Workshops II	**R**	**6**				2015-2016	
ME194-2 Thermodynamics II	**R**		**3**			2015-2016	

ME135-2 Materials Science and Technology	**R**			**3**		2015-2016	
ME196-2 Mechanics II	**R**		**5**			2015-2016	
ME197-2 Electrical Engineering	**R**		**4**			2015-2016	
OVERALL TOTAL CREDIT HOURS FOR THE DEGREE	54	***18***	***26***	***10***			
PERCENT OF TOTAL		*33.34%*	*48.14%*	*18.51%*			

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

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

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

Curriculum		Student Outcomes (SOs)										
Code	Name	a	b	c	d	e	f	g	h	i	j	k
ME111-1	Human Rights & Democracy						•					
ME122-1	Programming I	•				•						•
ME123-1	Mathematics I	•				•						
ME194-1	Eng. Drawing &Descriptive Geometry	•	•		•					•		•
ME145-1	Workshops I				•		•					•
ME136-1	Thermodynamics I	•	•			•						
ME197-1	Mechanics I	•				•						
ME191-2	English Language and Technical Technology									•		
ME192-2	Mathematics II	•			•	•						
ME143-2	Workshops II				•		•					•
ME134-2	Thermodynamics II	•	•			•						
ME135-2	Materials Science and Technology			•		•						
ME196-2	Mechanics II	•				•						
ME197-2	Electrical Engineering	•		•		•						•
ME221-1	Mathematics III	•	•			•						•
ME292-1	Mechanical Drawing and CAD	•		•		•						•
ME243-1	Strength of Materials I	•				•						
ME294-1	Fluid Mechanics I	•	•		•					•		•
ME295-1	Thermodynamics III	•	•			•						
ME296-1	Manufacturing processes	•	•			•						
ME297-1	Mechanics III	•	•			•						
ME221-2	Mathematics IV		•	•								•
ME292-2	Power Plant Cycles	•	•			•						
ME243-2	Strength of Materials II	•				•						
ME294-2	Fluid Mechanics II	•	•			•						
ME295-2	Electronics and Integrated Circuits	•	•			•						
ME226-2	Programming II	•	•			•						
ME297-2	Fuels and Combustion Processes	•				•						
ME391-1	Gas Turbines and Compressors	•				•			•		•	•
ME392-1	Heat Transfer I	•	•			•						
ME393-1	Theory of Machines	•	•									
ME394-1	I.C. Engines	•				•						•
ME395-1	Electrical Power and	•	•		•	•						

	Machines											
ME396-1	Mechanical Design I	•		•	•	•	•	•				
ME327-1	Numerical Analysis	•				•						
ME391-2	Steam Turbines	•				•			•			
ME392-2	Heat Transfer II	•	•			•						
ME393-2	Vibration	•	•	•								
ME394-2	Hydraulic Power Plants	•			•			•				•
ME395-2	Microprocessor and Microcontrollers	•				•					•	•
ME396-2	Mechanical Design II	•		•	•	•	•	•				
ME397-2	Steam Generators	•	•			•					•	

CRITERION 6. FACULTY

A. Faculty Qualifications

Table 6-1contains the faculty qualifications summary.

Qualifications of Faculty

Appendix B shows qualifications of faculty members, the extent and breadth of their eligibility to cover all required disciplines and the curriculum of the Mechanical Engineering of Power Plants program of the Department of MechanicalEngineering, as the Appendix shows areas of research specialization for faculty members.

B. Faculty Workload

Table 6-2contains the Faculty Workload Summary.

Teaching Load

Department of mechanical Engineering 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.

C. Faculty Size

Size of the Faculty

The number of faculty members in the department of mechanical engineering for the academic year 2015-2016 is (112). 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 55.3 % of doctorate degree holders and 44.7% of master's degree holders. According to gender , the faculty members of the males is 80.3 % and females is 19.7 % , and according to scientific degree , 6.2 % professors , 24.1% assistant professors, 37.5 % teachers , and 32.2% a assistant teachers .

The faculty is branching into interdisciplinary and several areas of technology in mechanical engineering can be classified into three major specialties: Thermal Power, 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.

The table below 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).

The number of faculty according to their classifications and specializations for 2015-2016.(Mechanical Engineering Department)

Specialization	Certificate		Scientific title				Gender		Total
	Ph.D.	MSc	Professor	Assistant Professor	teacher	assistant teacher	Male	Female	
Thermal Power	40	36	5	16	29	26	61	15	76
Applied Mechanics	18	13	1	8	12	10	25	6	31
Production Engineering	2	-	-	2	-	-	2	-	2
Other	2	1	1	1	1	-	2	1	3
Total	62	50	7	27	42	36	90	22	112

Department of mechanical engineering has capability and strong ability of education as well as a strong commitment in the field of university education because of its own expertise accumulated over years. Ratio of students to faculty is almost 8.95:1 (Teachers holders of PhD), 11:1 (for holders of Master), and 4.95:1 (for all teachers), which is close to the average in the University of Technology. Thus, the faculty in the department able to provide a program that is enough to interact with students.

D. Professional Development

The FacultyVitaeare contained in the **Appendix B**

Department Development

Activities of faculty members for development and professionalism include : attending seminars and lectures , participating in training workshops, professional conferences , professional writing Activities , review activities ,producing new and innovative research, and training programs inside and outside Iraq , including:

- Study leave (outside country) is a program that allows faculty members who did not get a Ph.D. to get a chance to study abroad. The ministry provides tuition fees, travel, and a monthly stipend. It also includes participations through temporary contracts with the same benefits. Many professors participated in this program successfully.
- Continuing Education Center offers professional development courses and training for faculty members. It is requested from all new faculty members to obtain a certificate of participation for training in the first year of work.
- Sabbatical leave: the university supports professional faculty members for work (full-time) after five years of service. Some faculty members have benefited from this opportunity.
- Training teaching staffs outside Iraq world prestigious universities according to the program of the Directorate of Research and Development at the Ministry of Higher Education and Scientific Research.

E. Authority and Responsibility of Faculty

Interaction with Students

The ministry and University of Technology affirm to improve the quality of teaching through interaction with students by activating the open-door policy, a commitment to the number of weekly work hours, and supervision on the design for specialized project teams stages as well as graduation projects, which require holding regular weekly meetings with the students.

Also some faculty members have consulting in the professional associations that require attending regular meetings, providing advice to the leaders of the student, and traveling with the students for the purpose of supervising the research or participating in regional and national conferences and competitions.

Interaction with Government and Labor Market

University of Technology has contributed over many years to provide services for many different government ministries and private sector. These services cover a variety of activities including engineering consultancy, conducting a preliminary and final designs, verification of designs, oversee the implementation of projects, organizing courses, developmental courses for continuing education, research and evaluation of patents, contracts research for the graduate students with government ministries, and other activities.

Educational Guidance (Student)

Students are being dealt and provided with advice and guidance by the Student Affairs Committee in the Department of Mechanical Engineering. This committee is composed of some faculty members and is responsible for advising students and helping them in their professional development.

Several meetings are held with members of the faculty and with the students outside the lecture times to look at the scientific affairs and university research activities. Advice is being provided for students by all members of the faculty on the basis of experience, guidance and voluntarily.

Power and Responsibility

The president of the University gives power to head Assistant of the department and heads of branches on the recommendation of the department head, and they continue their work for four years, moreover; at the end of the four years, his functions can be extended or instruct another member of the faculty members to take his place. The administrative assistant of department head gives power to members and coordinators of various committees, as well as distributes administrative tasks. Scientific Assistant of department head manages and coordinates all terms concerning scientific committees, management plan and the scientific curriculum of the department. Head of department heads meetings of the Board department (which consists of administrative and scientific Assistants, heads of branches and representative of the teachers' union) and he also represents department in the meetings of the Council of University of Technology , The head of the department has the responsibly of scientific , administrative and financial authority .

Responsibility of faculty is full-time work according to the law of the university service and that is included teaching, research, institutional services, committees and professional community services. In addition to the possibility of initiating a faculty member in updating

curriculum under the supervision of the Scientific Committee and put it through the meetings of department in the General Assembly. A proposal is being offered to the Scientific Committee in the University of Technology concerning amending the curriculum for final approval.

Table 6-1. Faculty Qualifications

Name of Program: Mechanical Engineering of Power Plants

Faculty Name	Highest Degree Earned-Field and Year	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
Sabah Tarik Ahmed	**PhD.**	**T**	**FT**	**38**	**38**	**38**		**H**	**H**	**M**
MoayedRazoki Hasan	**PhD.**	**T**	**FT**	**28**	**28**	**28**		**H**	**H**	**M**
Ekhlas Mohammed Fayyadh	**PhD.**	**T**	**FT**	**35**	**35**	**35**		**H**	**H**	**M**
Ibtihal Abdul-Razzaq Mahmood	**PhD.**	**T**	**FT**	**28**	**24**	**24**		**H**	**H**	**M**
Qusi Ghad AbdAlghfour	**PhD.**	**T**	**FT**	**32**	**24**	**24**		**H**	**H**	**M**
Abdul SatterJawad	**PhD.**	**T**	**FT**	**25**	**20**	**25**		**H**	**H**	**M**
Amir Hameed Majeed	**PhD.**	**T**	**FT**	**35**	**33**	**35**		**H**	**H**	**M**
Hassan M. Alwan	**PhD.**	**T**	**FT**	**38**	**10**	**10**		**H**	**H**	**M**
WafaabdSoud	**PhD.**	**T**	**FT**	**25**	**21**	**25**		**H**	**H**	**M**
Hayder Abed Dhahad	**PhD.**	**T**	**FT**	**6**	**6**	**6**		**H**	**H**	**M**
FalahFakhirHatam	**PhD.**	**T**	**FT**	**28**	**28**	**28**		**H**	**H**	**M**
Ahmed Abdulnabi Imran	**PhD.**	**T**	**FT**	**14**	**14**	**14**		**H**	**H**	**M**
Ammar S. Hamid Merza	**PhD.**	**T**	**FT**	**10**	**10**	**10**		**H**	**H**	**M**
Amer SadunAbud-Zahra	**PhD.**	**T**	**FT**	**10**	**10**	**10**		**H**	**H**	**M**
Noor Hussain Hamza	**Msc.**	**T**	**FT**	**3**	**3**	**3**		**H**	**H**	**M**

1. Code: TT = Tenure Track T = Tenured NTT = Non Tenure Track
2. The level of activity, high, medium or low, should reflect an average over the year prior to the visit plus the two previous years.

Table 6-2. Faculty Workload Summary, MEPP

No	Faculty Member (name)	PT or FT[1]	Classes Taught (Course No./Credit Hrs.) Term and Year[2] 2015/2016	Program Activity Distribution[3]			% of Time Devoted to the Program[5]
				Teaching	Research or Scholarship	Other[4]	
1	Sabah Tarik Ahmed	FT	ME764/2hrs	50%	40%	10%	100%
2	MoayedRazoki Hasan	FT	ME354/5 hrs	50%	40%	10%	100%
3	Ekhlas Mohammed Fayyadh	FT	ME653/5hrs	50%	40%	10%	100%
4	Ibtihal Abdul-Razzaq Mahmood	FT	ME135-2/3hrs	50%	40%	10%	100%
5	QusiGhadAbdAlghfour	FT	ME543/5hrs	50%	40%	10%	100%
6	Abdul SatterJawad	FT	ME632/5hrs	50%	40%	10%	100%
7	Amir Hameed Majeed	FT	ME754/5hrs	50%	40%	10%	100%
8	Hassan M. Alwan	FT	ME542/5hrs	50%	40%	10%	100%
9	WafaabdSoud	FT	ME564/5hrs	50%	40%	10%	100%
10	Hayder Abed Dhahad	FT	ME134/2hrs	50%	40%	10%	100%
11	FalahFakhirHatam	FT	ME631/5 hrs	50%	40%	10%	100%
12	Ahmed Abdulnabi Imran	FT	ME322/3hrs	50%	40%	10%	100%
13	AmmarS.HamidMerza	FT	ME732/3hrs	50%	40%	10%	100%
14	AmerSadunAbud-Zahra	FT	ME322/3hrs	50%	40%	10%	100%
15	Noor Hussain Hamza	FT	Lab.	50%	40%	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.

CRITERION 7. FACILITIES

A. Offices, Classrooms and Laboratories

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.

• Building (B) (Branch): It is attached to the department building.

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 five ones of engineering specialties contained in the engineering department includes coordinators, secretarial and some of faculty members. 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.

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, and these rooms are well furnished carpeted, air-conditioned and equipped with Internet service. In addition to the fact that allteaching staff are provided with a laptop computer.

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:

• Ebeem board with a contact pen.

• Ketab 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.

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 Labs names, their areas, instruments numbers, and the subjects it serves and the required instruments. 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 (4-7) experiments during the academic year and (8-12) exercises for programming and computers laboratories. There is a comprehensive examination on all tests and exercises at the end of the academic year and the degree of the laboratory is the rate of total degrees of reporting and discussing all experiments.

There are 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. 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.

B. Computing Resources

The general computer labs are located on the 1st floor of Mechanical Engineering Department main building, next to the halls study area. There are 40 seats, available to all ME students bothgraduate and undergraduate, on a first come basis. The lab is proctored and open hours from 8:00 AM to 2 PM. A High Performance Computing (HPC) facility provides remote access to high level programming. The computer labs are primarily used by ME undergraduates students, but is also available to ME graduate. Also, these labs used for teaching the undergraduate students courses such as Computer Graphics, Computer languages. There are wide range of engineering software is available on all of these computing platforms. The software types include SolidWorks, AutoCAD, graphics simulation and analysis software (FEM, FEA, and CFD), materials databases, and mathematical modeling and programming software (Matlab, Labview, etc.).

C. Guidance

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. 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.

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.

D. Maintenance and Upgrading of Facilities

General Maintenance

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.

Lab. Equipment Maintenance

All equipment, when possible, is maintained by the ME lab manager and maintenance staff. The lab manager perform equipment set-up for various experiments and are readily aware when the equipment requires maintenance or repair. Some complex equipment, such as scanning electron microscopes, has service agreements and is routinely serviced by factory service technicians. Other complex equipment, such as electronic hardness testers and microscopes are regularly serviced by outside specialty technicians. Further support can be obtained from UOT Zone Maintenance. Repairs beyond the capabilities of the lab manager and support staff require bringing in qualified service technicians from outside companies.
The adequacy of all processes relating to equipment planning, acquisition, and maintenance seems adequate. Undergraduate labs in Mechanical Engineering require a large number of different types of modern testing equipment. The requirement for updating obsolete equipment and acquiring equipment with the latest technology to prepare our students for their future careers is critical, and the ME program is dedicated to maintaining this full array of laboratory equipment.

E. Library Services

Department Library

The area of this library is (100) m^2 and is used by students of graduated and under graduated 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.

• The total number of titles is (2805) and the number of books is (5659) includes (267) Arabic Book, (2078) English book. The number of periodicals is (454) in Arabic and (133) in English.

• The number of master's and doctoral thesis is (756) for both of the type and the 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 suites for the department of mechanical engineering which has (1600) Arabic Book, (3077) English , (988) thesis and (250) titles of periodicals and magazines. These books can be borrowed by under graduated& graduated studies students and the employees equally through using participation identities for limited period.

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:

o putting all the engineering and scientific books into portfolio .
o putting all thesis within the thesis portfolio .
o putting all the images within the images portfolio.
o putting all the engineering programs within the programs portfolio.
o putting all the scientific conferences within the conferences portfolio.
o 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. 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.

F.Overall Comments on Facilities

- 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 is (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) m^2, 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 four stages and their specialties and two workshops for the initial and graduate studies.
- M and B buildings are furnished, air-conditioned, equipped with internet services.
- There is (180) computers distributed among programming labs, Internet unit, faculty offices and the unites, division of the high command headquarters and the distributor.
- The major pieces of equipment used by the program in support of instruction are listed in **Appendix C**

Table (7.1) classrooms, its area and capacity.

No	Hall Name	Area M^2	capacity During the year 2015-2016	actual occupancy During the year 2015-2016
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

Table(7-2)Labs names, their areas, instruments numbers, and the subjects it serves and the required instruments.

No.	Lab name	Subjects served by the lab	Area m^2	Instruments numbers	
				Available	Valid
1	Mechanics	Mechanics I,II	41	6	6
2	Thermo 1	Thermo	42	5	5
3	Electric	Electric	20	14	9
4	Thermo 2	Thermo	300	3	2
5	Strength of Materials	Strength of Materials	41	7	3
6	Fluid 1	Fluid 1	198	5	5
7	Air Conditioning	Air Conditioning	65	11	10
8	ICE	ICE	145	7	3
9	Theory of machines	Theory of machines	55	15	14
10	Heat transfer	Heat transfer	52	5	5
11	Fluid 2	Fluid 2	198	5	5
12	Control	Control	45	5	5
13	Vibration	Vibration	45	5	5
14	Gases	Gas dynamics	36	1	1
15	Power plants	Power plants	300	4	4
16	Equipment Technology	Equipment Technology	35	4	4
17	Refrigeration	Refrigeration	65	9	8
18	Renewable energy	Renewable energy	41	5	5
19	Airplane engines	Airplane engines	36	Illustrative sec.	-
20	Maintenance of Airplane	Maintenance of Airplane	36	Illustrative sec.	-
21	Flight dynamics	Flight dynamics	36	Illustrative sec.	-
22	Fuel	Fuel	145	Illustrative sec.	2
23	Automotive theory	Automotive theory	11	Illustrative sec.	-
24	Graduate workshop	Graduate students projects	30	Measurement inst. & equip.	
25	Programming 1	Fortran +CAD	30	21	21
26	Programming 2	Matlab+CAD	69	29	29
27	Programming 3	Num. Analysis & Solid W.	38	23	23

CRITERION 8. INSTITUTIONAL SUPPORT

A. Leadership

The Mechanical Engineering Department is led by an experienced administrative leadership team. Dr. Moayed R. Hasan Assist. Professor of Mechanical Engineering serves as the head of the department and has done so for 2 years. In addition to leading the department, some of his time has been devoted to developing the under graduate curriculum and developing changes that are consistent with modern trends in engineering education. Assist. Professor Ekhlas M. Al-Fayyadh serves as the head of Mechanical Engineering of Power Plants since September 2015. He worked in collaboration with the Department Head to developing the curriculum and the Mechanical Engineering of Power Plants.

B. Program Budget and Financial Support

Program Budget Process and Sources of Financial Support

The budget for the undergraduate program can be divided into the following major categories:

1. Support for Teaching Assistants (TA's).
2. Ministry Budget

The budgeting process for TA's starts with an accounting of courses that will be offered for the evening study students. The expected costs are determined using average appointment rates and taking into account any general raises in rates that have been approved for the coming academic year. Each year a budget is determined specifically for operations. This budget is split into staff support, equipment maintenance and upgrades, software licenses, and miscellaneous supplies. The budget for staff is based on the appointment rates for permanent staff and the estimated needs for temporary employees (generally student assistants). Major equipment, including computers, is upgraded using a five year replacement plan. Associated costs for these upgrades are estimated each year. Annual miscellaneous supplies and operation costs are estimated using historical data. The Undergraduate Office handles student registration and records, course scheduling, and student advising. The budget for staff in this office is based on the appointment rates for permanent staff and the estimated needs for temporary employees (generally student assistants). Annual operation costs are estimated using historical data.

Funds needed for laboratory equipment maintenance are determined from known maintenance contracts and historical records. Each year additional funds are made available to the department for upgrading teaching laboratory equipment. The amount of these equipment upgrade funds is set each year by the Head's office according to the needs submitted by the department. The budget for the staff responsible for operating and maintaining teaching laboratory facilities is based on the projected appointment rates for these permanent staff. See Table (8-1)

Sources of Financial Support

The primary source of funds is an operating budget fixed for the department by the Ministry of Higher Education and Scientific Research. Additional funds are allocated specifically for UOT support. These funds are obtained from various sources, including a set allocation from the university, funds made available due to administrative and research leaves by faculty, and supplementary allocations by the Head's office using "soft" money sources.

Adequacy of Budget

Although constrained by tightening budgets, allocation of funds has been sufficient to maintain operations and teaching needs. There was a reduction in allocations for the 2015-2016 year, and this was handled by reducing non-essential purchases for the department.

Adequacy of Support Personnel and Institutional Services

The department has a wide range of support personnel including undergraduate office staff to advise and register students, technicians to operate and maintain teaching laboratory facilities, administrative assistance to aid faculty, and machine shop technicians to help students in construct models and equipment for projects. Each of these staff positions is adequately funded. Major services provided to the students are computer center, which give students access to specialized software, and the machine shop. These computer services and machine shop service are also adequately funded.

C. Staffing

Activities of staff members for development and professionalism include: attending seminars and lectures, participating in training workshops, professional conferences, and training programs inside and outside Iraq, including:

- Continuing Education Center offers professional development courses and training for staff members. It is requested from all new staff members to obtain a certificate of participation for training in the first year of work.
- Training teaching staffs outside Iraq world prestigious universities according to the program of the Directorate of Research and Development at the Ministry of Higher Education and Scientific Research.

D. Faculty Hiring and Retention

1. Describe the process for hiring of new faculty.
2. Describe strategies used to retain current qualified faculty.

E. Support of Faculty Professional Development

All the development activities such as sabbaticals, travel, workshops, seminars, etc., are planned and supported according to the program of the Directorate of Research and Development at the Ministry of Higher Education and Scientific Research.

PROGRAM CRITERIA

1. Curriculum

Criteria for Mechanical Engineering Program:

Our program satisfyMechanica Engineering programs requirements. For Mechanical Engineering part, our curriculum satisfy ABET Mechanical Engineering criteria:

The curriculum must require students to apply principles of engineering, basic science, and mathematics (including multivariate calculus and differential equations); to model, analyze, design, and realize physical systems, components or processes; and prepare students to work professionally in both thermal and mechanical systems areas.

2. Faculty

The program must demonstrate that faculty members responsible for the upper- level professional program are maintaining currency in their specialty area. The curricular requirements of the Mechanical Engineering Program Criteria are satisfied by attainment of Student Outcomes 'a', 'c' and 'e'. First, the component of "mathematics (including multivariate calculus and differential equations)" was included in our Student Outcome 'a' as described in the section "CRITERION 3 STUDENT OUTCOMES". Therefore, the first part of the curricular requirements is satisfied by attainment of the Student Outcome 'a' and the second part, by the Student Outcomes 'c' & 'e'. The assessment and evaluation of the Student Outcomes 'a', 'c' and 'e' are described in the section "CRITERION 4 CONTINUOUS IMPROVEMENT".

3. Student Outcomes:

a. an ability to apply knowledge of engineering, science, and mathematics (including multivariate calculus and differential equations).

c. an ability to design systems, components, or processes to meet desired needs within realistic constraints.

e. an ability to identify, formulate, and solve energy and renewable energies engineering problems;

The faculty requirements of the Mechanical Engineering Program Criteria are satisfied by the qualifications of our faculty members, which are described in the section "CRITERION 6.

APPENDICES

Appendix A – Course Syllabi

(Supplement)

Appendix B – Faculty Vitae

(Supplement)

Appendix C – Equipment

The major pieces of equipment used by the program in support of instruction are listed below:

- 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.

Appendix D – Institutional Summary

Programs are requested to provide the following information.

1. The Institution

a. Name and address of the institution
Mechanical Engineering of Power Plants
Mechanical Engineering Department
University of Technology
Baghdad - Iraq

b. Name and title of the chief executive officer of the institution
Dr. Moayed R. Hasan

c. Name and title of the person submitting the Self-Study Report.
Dr.Ekhlas M. Al-Fayyadh

d. Name the organizations by which the institution is now accredited, and the dates of the initial and most recent accreditation evaluations.
N/A

2. Type of Control

Mechanical Engineering of Power Plants. As a branch from Mechanical Engineering Department is a comprehensive state-funded institution by the Ministry of higher Education and scientific research of Iraq. Overall responsibility for the university resides in an autonomous Board of Regents appointed from the University presidency and confirmed by the Ministry. The board delegates authority for the internal management of the institution to the president. The faculty Dean is specified by the University Board. The University Board has legislative jurisdiction over policies affecting the academic mission of the university.

3. Academic Support Units

Mechanical Engineering of Power Plants. Branch has no individuals responsible for each of the units that teach courses required by the program being evaluated, e.g., mathematics, physics, etc. All the former units are taught by ME staff.

4. Credit Unit

One academic year normally represents 30 weeks of classes. Air-conditioning and Refrigeration Eng. Program of Mechanical Engineering Department use the course

hour as the basic unit of academic credit. One theoretical hour is defined as two units, while one laboratory hour is defined as one unit. The last week of each semester is dedicated to final exams, with each course typically meeting once for a single 180 minute test.

Signature Attesting to Compliance

By signing below, I attest to the following:

That (Mechanical Engineering of Power Plants Program) 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.*

Assist. Prof. Dr. Ekhlas M. Al-Fayyadh
Head of Mechanical Engineering of Power Plants

Signature **Date**

Assist. Prof. Dr. Moayed R. Hasan
Head of Mechanical Engineering Department

Signature **Date**