Ministry of Higher Education and Scientific Research
University of Kirkuk
College of Engineering
Department of Mechanical Engineering

Self Assessment Report

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1. INTRODUCTION

1.1 Foundation of the Department of Mechanical Engineering

The Department of Mechanical Engineering was founded on 19/7/2010 as the third department of the College of Engineering after Civil and Petroleum Engineering departments. The first intake to the Mechanical Engineering (ME) department was in the same year of its foundation with a total number of 70 students including guest students from other Iraqi universities.

The curriculum of the department was designed by the faculty members of the College of Engineering to offer a first degree in general mechanical engineering. It is expected for the first batch of students to graduate in June 2014.

Graduates from ME department will have good career opportunities as there is a continuous demand for mechanical engineers in the various state and private industries, municipal services and many other sectors.

1.2 Degree Title

The undergraduate degree to be offered by the Department of Mechanical Engineering is the Bachelor of Science (B. Sc.) in Mechanical Engineering.

1.3 Degree Requirements

To receive a B. Sc. degree in Mechanical Engineering a student must satisfy all requirements of the Department which can be summarized as follows.

- Minimum period of study is four (4) years
- Completion of 152 credit hours of course work and this includes
  - 93 credit hours of Mechanical Engineering subjects
  - 4 credit hours of final year graduation project
  - 45 credit hours of general engineering subjects and mathematics
  - 10 credit hours of humanities and English language subjects
- Fulfillment of one month industrial training (summer training).
- Minimum pass marks in each course is 50 out of 100 (maximum marks).
- Fulfillment of 90% attendance to theoretical and practical classes

A student should obtain at least a grade (Fair) or minimum pass mark in all the courses offered and should attend and pass an industrial summer training course for a period of one month. The Industrial Summer Training Unit of the College of Engineering in cooperation with ME Department is responsible for the placement procedure of the students at the various industries and factories available at the nearest location to the student's home area. The staff of the department in cooperation with the host supervising engineer watches and assesses the performance of the students.

1.4 Program Mode

The program is a full-time on-campus education offered during the day. The system of study adopted by the College of Engineering and the Department of Mechanical Engineering is the annual system, i.e. a course subject is taught for two semesters (30 weeks) with a two-week midyear break between the two semesters and two months of summer break at the end of the academic year. The assessment is based on quizzes, tests, lab reports, projects, midyear exams and final exams.

A student who fails to pass in 50% or less of the subjects taught in his/her first attempt will be given a chance to reappear in makeup exams organized by the College before the start of the next academic year.
A students who fails in more than 50% of the subjects taught or fails in the second attempt will have to repeat his/her study at the same level for the next academic year.
A student who fails two successive years at a certain level will be dismissed off the University.

Maximum period allowed for a student to obtain the degree is 6 years unless otherwise exempted by legal reasons.

1.5 Factors Affecting the Success of the Program

The program has not been assessed yet and this is the second self assessment report. Therefore, no statement can be made presently about the program's success. Even with this assessment report, the assessment still remains incomplete as the program needs further a year of time for its first batch of students to graduate and join practical life.
However, the following may contribute to the program's success:

- The design of the curriculum
- Construction of the new campus with adequate lecture and seminar halls and lab spaces.
- Appropriate computer and internet facilities
- Adequate laboratory and workshop equipments
- Young and enthusiastic staff

1.6 Consistency between Program Activities and College Strategies

The ME Department as part of the College of Engineering endeavors towards the achievement of program objectives which are inline with the vision and mission and objectives of the College. All academic plans and activities decided at the Department level are subject to the approval of the Board of Engineering College.

1.7 Program Deficiencies, Weaknesses and Concerns

This is the second self study report for the program. No deficiencies and concerns are noted during the past two years since the foundation of the Department.

1.8 Rating of Academic and Administrative Performances

As a part of the College of Engineering according to the organizational structure of the College and the Department (see Appendix I) all academic and nonacademic activities of the program are planned, executed and evaluated by the Department subject to the approval of the Dean and the College Board.
The execution of program academic activities is assigned to the faculty and supporting staff as well as lab technicians. The Departmental Board is responsible for the distribution of teaching, administrative and lab demonstration loads among the staff of the Department subject to the approval of the Dean.
The faculty members are mainly involved in teaching program curriculum courses and direct assessment of students' performance. The supporting staff and lab technicians are assigned the duties of lab demonstration and assessment.

The Head of the Department is responsible for the evaluation of performance of each individual in the Department subject to the approval of the Dean of the College. The evaluation forms of the faculty and the supporting staff are shown in Appendix I.

1.9 SWOT Analysis

Strengths (Internal)	Weaknesses (Internal)
• Faculty - Dedicated and experienced staff - Enthusiasm towards building a reputable Department - Encouraging salaries and wages - Reasonable number of scholarships and study leaves for improving the faculty • Curriculum - Designed to meet local and international needs • New laboratory equipments from well known origins • Virtual library and internet facilities. • Good relationship among the staff	• Insufficient number of qualified staff with Ph. D. degree • Insufficient trained technicians and supporting staff • Absence of administrative and secretarial staff in the Department • Inadequate lecture halls • Limited number of office rooms for the faculty • Inadequate training opportunities for the faculty • Inadequate funding for participations in international conferences • Insufficient fund for research • Quality and quantity of students: - Large number of transfer students form other universities - Lack of motivation learn and to excel - Inadequate language and communication skills - Being used to spoon-feeding culture
Opportunities (External)	**Threats (External)**
• Reasonable budgets for developing the necessary laboratories of the Department. • Reasonable budget for purchasing text and reference books • Petrodollar funding projects for innovation of labs and workshops • Petrodollar funds for hiring human resources • Possibility of cooperation with existing local state and private industries	• Political instability of the country • Absence of security • Quality of incoming students • Emergence of rival private local and regional education institutions

1.10 Action Planning

Objectives: The following are the objectives of the program

- To have a sufficient number of faculty with Ph. D. degrees
- To have a sufficient number of trained technicians and administrative staff
- To have sufficient number of lecture halls and office rooms

Action Plans

- Nomination of eligible junior faculty members as Ph. D. candidates to the available scholarships, fellowships and leaves of absence opportunities.
- Formal requests for appointment of qualified staff, technicians and administrative staff
- Preparation to transfer to the new campus

Key Performance Indicator

- Appointment of one lecturer and another assistant lecturer
- One Ph. D. candidate has joined his study program in USA.
- Building of two lecture halls for first year students

Targets and timelines:

- The targeted timeline for having sufficient number of faculty with Ph. D. qualification, well trained technicians and administrative staff is 2020.
- The targeted timeline for shifting to the new compass is October, 2013.

2. ORGANIZATIONAL STRUCTURE OF THE DEPARTMENT

The main components of the current organizational structure of the ME Department, as shown in Fig. 2.1 are the departmental board, department committees, contract (temporary) staff and lab technicians. The ME department is part of the organizational structure of the College of Engineering as shown in Appendix I.

2.1 Responsibility of the Departmental Board

The Departmental Board is responsible for all matters related to academic, administrative, research and development activities of the department and acts according to the directions and policy governed by the College of Engineering Board and the University Senate. All academic staff are members of the Department Board. Accordingly the Departmental Board plans include the following

- Department's intake size for the new academic year
- Workload distribution among the staff
- Required scholarships or study leaves for the faculty
- Required teaching staff, technicians and administrative staff
- Estimation of required budget for innovation and development of laboratories

2.2 Mechanisms of Program Planning

The Department of Mechanical Engineering is part of the organizational structure of the College of Engineering. Initially, program plans are proposed and discussed at Committee and Departmental Board meetings. The proposed plans by the Departmental board are submitted to the College Board. The College Board makes decisions inline with the policy of the University and subject to the approval of the University Senate.

2.3 Interaction with other Departments

The three Departments of the College of Engineering cooperate in academic and scientific matters for the benefit of the students of the College of Engineering. During this academic year (2012/2013) the ME Department cooperated with the other departments in the following:

- The course subject of Fluid Mechanics was taught by the staff of ME Department to the second-year students of Petroleum Engineering Department
- Fluid Mechanics Lab was used by both Civil and Petroleum Engineering Departments students and the demonstrations were conducted by the technicians of ME department
- The mechanical workshop was used by Civil Engineering Department students
- The course subject of Engineering Mechanics was taught to Civil Engineering first-year students

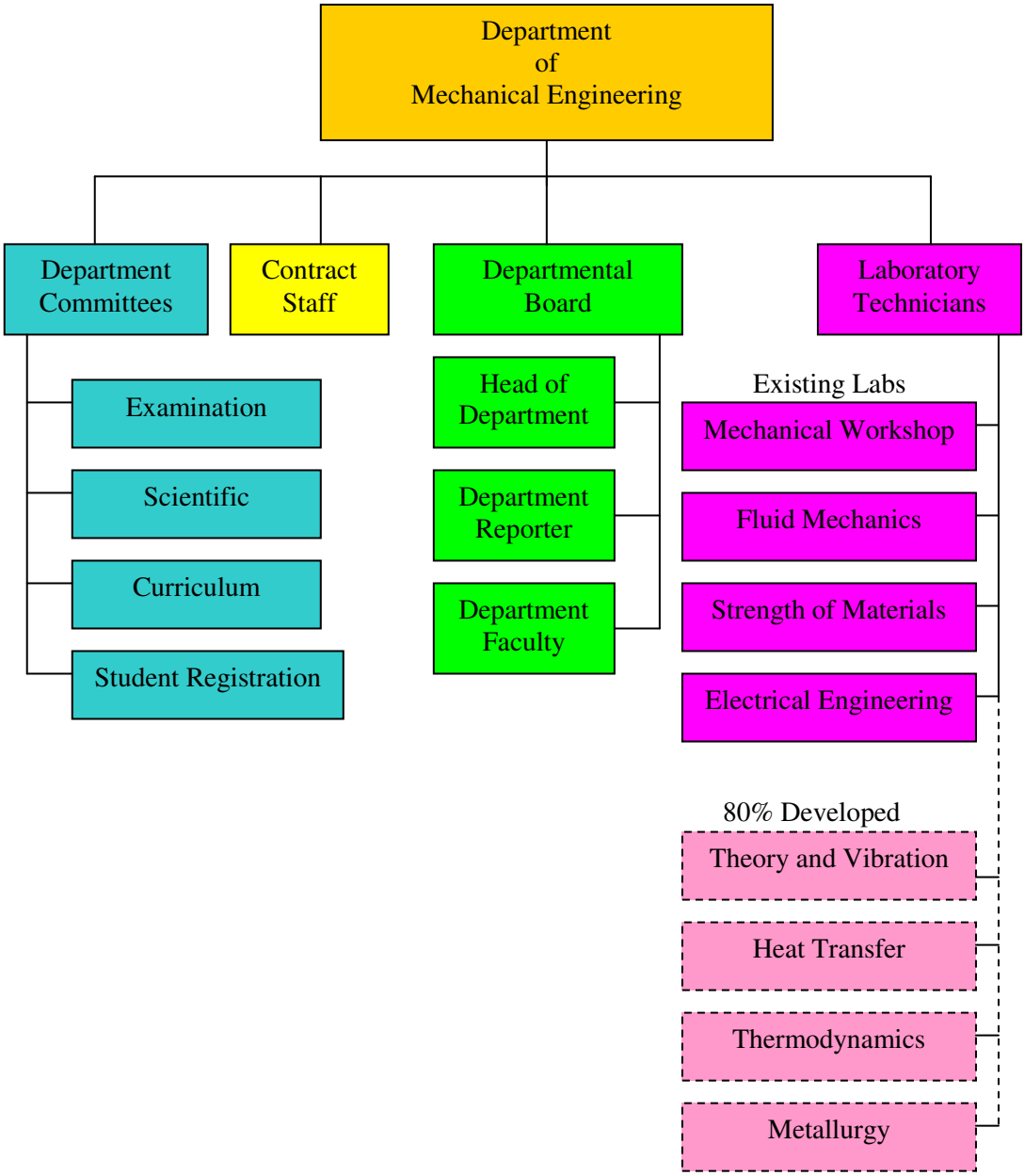

Fig. 2.1 Organizational Chart of Mechanical Engineering Department

2.4 Communication Facilities

Traditional written memorandum is the main method of communication between the Department and the College and among the three Departments.

2.5 SWOT Analysis

Strengths (Internal)	Weaknesses (Internal)
- Firm and sound basis of program plans - Integrity of work - Secure and safe documentation	- Absence of administrative staff - Long decision making and approval route - Very slow communication method - Difficulty in retrieving of information
Opportunities (External)	**Threats (External)**
- Appointment of administrative staff - Building of electronic communication and documentation systems	Nil

2.6 Action Planning

To remedy the weaknesses pointed out in the SWOT analysis it is necessary to take serious measures and actions at the University and the College levels. It is beyond the responsibility and capability of the ME Department to take any such measures or actions.

The following measures are deemed necessary in order to remedy the weaknesses:

- Appointment and developing of well trained and experienced administrative staff
- Building of electronic communication system
- Building of electronic documentation system

3. PROGRAM OBJECTIVES

3.1 Vision of the Department of Mechanical Engineering

The Department of Mechanical Engineering strives to become an exemplar institution for higher education in the country and in the region.

3.2 Mission of the Department of Mechanical Engineering

- Provide the society, industrial and servicing foundations with qualified mechanical engineers
- Educate and disseminate the most modern science and engineering knowledge in the area of mechanical engineering
- Provide consultancy and scientific advice to social and industrial foundations

3.3 Program Constituency

The following are viewed to be the constituents of the program

- **Students:** The program provides a good environment where the students can learn through lectures in the classroom and through interactions with the faculty, teaching assistants and with each other.
- **Alumni:** The ME Department strives to have its future graduates become productive members of the society and be proud of being graduates of this program
- **Employers:** It is the commitment of the program that its graduates will be well educated and possess the fundamental knowledge that will let them grow intellectually and be successful in their career path.
- **Faculty:** The backbone of the program is the faculty. The program commitments and striving towards being a leading program cannot be achieved without a dedicated, experienced and enthusiastic faculty

3.4 Program Educational Objectives (PEO)

The program is planned to prepare graduates to achieve the following in their career and professional accomplishments:

1. Graduates with broad based knowledge and fundamentals of engineering to solve problems, generate new ideas and develop products for the need of the society
2. Graduates with competencies in engineering design and analysis.
3. Successful and productive engineers with skill in communication, management, teamwork and leadership.
4. Graduates with good understanding of moral values, professional ethics and responsibility towards society and environment
5. Graduates who recognize the importance of and engage in life-long learning.

3.5 Consistency between the PEO and the Mission of the Department

The Department of Mechanical Engineering is a newly established and as the third department in the College of Engineering. The PEO of the Department are inspired from the mission and objectives of the College of Engineering and thus they are closely linked to each other.

3.6 Establishing and Reviewing of PEO

The program objectives are established by incorporating the mission and vision of the Department as well as the College of Engineering and discussions during Departmental and College Board Meetings. Since the program is new, reviewing of the PEO has not taken place. The plan for reviewing process of the appropriateness of the objectives and ensuring their achievements is to be through the following channels:

1. Alumni survey
2. Industry and employers survey
3. Students survey
4. Faculty discussions

4. STUDENTS

4.1 Student Admission

Admission to all Iraqi state universities is controlled by the Ministry of Higher Education and Scientific Research.

Applicants seeking admission at an undergraduate Engineering program should satisfy any of the following requirements:

- Iraqi secondary school certificate (Scientific stream) or its equivalent with a competitive rating percentage.
- Top first Diploma holders from Iraqi Technical Institutes
- First-year students from College of Science who have passed with a grade Very Good or above
- Outstanding state employees

Distribution of students to the three Engineering Departments of the College of Engineering, including the ME Department, is made according to the capacity plan of the Departments and the rating average of the applicants as well as their desires.

4.2 Credit Transfer Process

The University has a clear policy on transfer of credit from other institutions. A transfer student from other recognized institutions to levels higher than the first year level should provide evidence that he/she has covered similar course subjects in the previous years with equal number of credit hours. The Scientific Committee of the Department decides the equivalence of the courses taken by the transfer student. The process is subject to the approval of the College of Engineering Board and the University Senate.

4.3 Guest Students

During the past few years and due to security reasons the Ministry of Higher Education and Scientific Research has adopted a policy of allowing first year students from the various Iraqi universities to join similar programs at the universities in their home towns.

Table 4.1 shows the history of admission to the ME Department for the past three years.

Table 4.1 History of Admission

Academic Year	Number of Admitted Students	Number of Transfer Students	Number of Guest students	Total
2010/2011	23	0	32	55
2011/2012	19	0	41	60
2012/2013	20	55	-	75

4.4 Evaluation of Student Performance

Student performance is assessed by the Department faculty throughout the academic year by quizzes, tests, midyear exams and final exams. To the approval of the College Board, the Departmental Board and inline with the policy of the University sets the percentage weights to the various assessment processes. Table 4.2 below shows a typical weighting schedule adopted by ME Department.

Table 4.2 Assessment weights

Assessment Method	Pure Theoretical Subjects	Subjects with Practical Part	Pure Practical Subjects
Quizzes and home assignments	5%	5%	-
Tests	15%	15%	35%
Lab Reports	0	15%	35%
Midyear Exam	20%	15%	-
Final Exam	60%	50%	30
Total	100%	100%	100%

4.5 Performance Grading

A student's performance is graded according to the total marks he/she has obtained in each course subject. Table 4.3 shows the grading schedule.

Table 4.3 Grading Schedule

Marks	Grade
90 - 100	Excellent
80 - 89	Very Good
70 - 79	Good
60 - 69	Medium
50 - 59	Fair
49 and below	Poor

By the end of the final examinations (first attempt and second attempt) students are provided with the grades they have achieved through the assessment processes throughout the whole academic year. A typical results slip is shown in Appendix II.

4.6 Student Advising

At the commencement of new academic year and upon admission of new first-year students, a welcome committee will be established at the College level including staff from all the three Departments as well senior students. This committee provides academic advising services and support for first-year engineering students in their transition from high school to the rigorous academic university life.

New first-year Mechanical Engineering students get further advice through Department briefings in which the Head of the Department, the Reporter and some of the senior staff give general information and talks about the teaching-learning and assessment processes and career opportunities for mechanical engineers and their role in developing and welfare of the society.

Student Advising Unit at the College level includes members from all the Departments gives advise regularly to all the students of the College in the various academic and nonacademic matters. In addition, students are promoted to consult the Department faculty whenever felt in need of advice.

4.7 Solidarity Funds

A solidarity funding program is run at the College level by the Accounts and the Student Advising Units. Donations from the staff of the College of Engineering are collected and distributed to the needy students every month.

4.8 SWOT Analysis

Strengths (Internal)	Weaknesses (Internal)
• Enthusiastic and dynamic young staff members • Good rapport between the staff and students	• Lack of motivation to learn and excel • Inadequate language and communication skills • Adoption of the "carry system" in which students who fail in two courses may still take advanced level courses without paying attention to the nature of the course subject.
Opportunities (External)	**Threats (External)**
• Possibility of reviewing the admission policy to engineering program • Possibility of limiting the number of transfer students	• Acceptance of large number of transfer students beyond the capacity of the Department • The policy of readmission of previously dismissed students irrespective of the number of years they will spend in the university • The chance of complementary " third attempt" exams given to failed students

4.9 Action Planning

To remedy the weaknesses pointed out in the SWOT analysis it is necessary to take serious measures and actions at the Ministry level. It is beyond the responsibility and capability of the ME Department to take any such measures or actions.

The following measures are deemed necessary in order to remedy the weaknesses:

- Abolition of the carry system
- Review of the admission and transfer policies.

5. PROGRAMME OUTCOMES

5.1 ABET Definition

Program outcomes are narrower statements that describe what students are expected to know and be able to do by the time of graduation. These relate to the skills, knowledge, and behaviors that students acquire in their matriculation through the program.

5.2 Program Outcomes (PO)

The program outcomes of the Bachelor of Science in Mechanical Engineering and according to the ABET definition are as follows:

(a) an ability to apply knowledge of mathematics, science, and engineering
(b) an ability to design and conduct experiments, as well as to analyze and interpret data
(c) an ability to design a system, component, or process to meet desired needs within realistic constraints such as economic, environmental, social, political, ethical, health and safety, manufacturability, and sustainability
(d) an ability to function on multidisciplinary teams
(e) an ability to identify, formulate, and solve engineering problems
(f) an understanding of professional and ethical responsibility
(g) an 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) a recognition of the need for, and an ability to engage in life-long learning
(j) a knowledge of contemporary issues
(k) an ability to use the techniques, skills, and modern engineering tools necessary for engineering practice.

5.3 Relationship between Program Outcomes to Program Educational Objectives

The alignment of the program outcomes (PO) with the program educational objectives is depicted in Table 5.1 below.

Table 5.1: Mapping between PO and PEO

		Program Educational Objectives (PEO)				
		1	2	3	4	5
Program Outcomes	a	✓	✓		✓	
	b	✓				
	c	✓	✓			
	d	✓	✓			
	e		✓			
	f		✓			
	g		✓		✓	
	h			✓		
	i			✓		
	j					✓
	k				✓	

5.4 Assessment of the Program Outcome

To ensure the achievement of the Program Outcome and Program Educational Objectives the Department of Mechanical Engineering adopts the two commonly used methods of measurements; the direct method and the indirect method.

a. The direct assessment

Student learning is the most important and main component of the overall assessment of the program. The program recognizes that student learning assessment should first take place on the basis of individual student learning of a particular course. The assessment is processed mainly by the Department faculty and lab demonstrators.

The direct assessment process is conveyed to the students during introductory classes at the beginning of each course. It is based on assessment types used in a course, such as assignment, quizzes, projects, midterms, tests and final exams. Lecturers take into account all assessment types in the calculation. Weights given to each type of assessment are discussed and decided by the Department Board Meetings. A typical assessment weighting is given in Section 4.4 of this report

This assessment is currently undertaken by the Department of Mechanical Engineering and for the past three academic years 2010/2011 to 2012/2013.

Final scores obtained by the students in each course subject are available in the students' record forms (Master Sheet) maintained at the Department's Examination Committee.

Examples of student's work such as assignments, quizzes, tests, etc. are compiled by the faculty of each course and are maintained in individual Course Binders located at the Department's Head Office.

b. The indirect assessment

This assessment method will be based on surveys and feedback from the Program Constituents. As described in Section 3.3 the Program Constituents are students, alumni, employers (industry) and faculty. Only senior (final year) students will be considered in the survey.

Since the program is new and anticipates its first batch of students to graduate at the end of academic year 2013/2014, this assessment has not been started yet. Surveying and questionnaire forms are not designed yet. The Department plans to discuss in its future Board meetings the survey forms and questionnaires to be provided by the Scientific Committee for this assessment method.

5.5 Improvement of the Program

No actions have been taken yet to make modifications or changes to the program or to program outcome. The Department deems that it is too early to take any action of this kind unless the indirect assessment results are available.

5.6 SWOT Analysis

Strengths (Internal)	Weaknesses (Internal)
• Enthusiastic and dynamic young staff members • New and sufficient lab equipments	• Number of qualified and well experienced staff • Number of well trained technicians • Quality of students
Opportunities (External)	**Threats (External)**
• The possibility of new staff appointment	• Career opportunity for graduates • No clear government plans for appointment of graduates

5.7 Action Planning

Objectives: The following are the objectives of the program

- To have a sufficient number of faculty with Ph. D. degrees
- To have a sufficient number of trained technicians and administrative staff

Action Plans

- Nomination of eligible junior faculty members as Ph. D. candidates to the available scholarships, fellowships and leaves of absence opportunities.
- Formal requests for appointment of qualified staff, technicians and administrative staff

Key Performance Indicator

- One Ph. D. candidate through government scholarship has joined the program in USA.
- Appointment of a lecturer and an assistant lecturer

Targets and timelines:

- The targeted timeline for having sufficient number of faculty with Ph. D. qualification, well trained technicians and administrative staff is 2020.

6. CURRICULUM

6.1 Design of the Curriculum

The program structure and course contents are designed to attain the vision, mission of the Department of Mechanical Engineering as well as the program educational objectives PEO and program outcomes PO.

The current program is designed for offering the degree of Bachelor of Science B. Sc. in Mechanical Engineering. The program was designed by the staff of the College of Engineering after an extensive review of the curricula of similar programs such as those of the Mechanical Department of Mosul University, Tikrit University and Baghdad University. The designed program curriculum was approved by the College of Engineering Board, the Senate of the University of Kirkuk and the Ministry of Higher Education and Scientific Research.

6.2 Program Curriculum

Table 6.1 shows the courses offered during four academic years and the credit hours of each course. Curriculum details are given in Appendix III

Table 6.1 Program Curriculum

Course Code	Coarse Title	Credit Hours
ME 101	Mathematics I	٦
ME 111	Engineering Mechanics I	٤
ME 102	Computer Programming I	٦
ME 112	Engineering Drawing and Descriptive Geometry	٥
ME 113	Principles of Manufacturing Processes	٦
ME 103	Electrical Engineering I	٥
ME 121	Human Rights and Democracy	٢
ME 122	English Language	٢
ME 201	Mathematics II	٦
ME 202	Computer Programming II	٦
ME 211	Fluid Mechanics I	٤
ME 212	Engineering Metallurgy	٤
ME 213	Strength of Materials	٤
ME 214	Mechanical Drawing	٢
ME 215	Engineering Mechanics II	٤
ME 216	Thermodynamics	٤
ME 217	Mechanical Engineering Lab I	٢
ME 301	Engineering & Numerical Analysis	٧
ME 302	Electrical Engineering II	٥
ME 313	Mechanics of Machines	٤
ME 311	Heat Transfer	٤
ME 312	Internal Combustion Engines	٤
ME 314	Fluid Mechanics II	٤
ME 315	Manufacturing Processes	٥
ME 321	Industrial Management	٤
ME 316	Mechanical Engineering Lab II	٢
ME 411	Machine Design	7
ME 412	Control & Measurements	4
ME 413	Refrigeration & Air Conditioning	6
ME 402	Industrial Engineering	4
ME 414	Vibrations	4
ME 415	Power Plants	4
ME 416	Engineering Materials	4
ME 417	Engineering Project	4
ME 418	Mechanical Engineering Lab III	2
	Total credit hours	152

6.3 Relationship between Curriculum and Program Outcome

The program outcomes PO are mapped to the Curriculum as shown in Table 6.2. The emphasis levels are 1, 2 and 3 representing little, moderate and strong emphases respectively.

Table 6.2 Mapping of Curriculum with PO

Course Code	Course Title	Emphasis Level to the Program Outcomes										
		a	b	c	d	e	f	g	h	I	j	k
ME 101	Mathematics I	3		1	1							١
ME 111	Engineering Mechanics I	3		2		3			3	2		
ME 102	Computer Programming I	1			3	1		٢	٢	٢		
ME 112	Engineering Drawing and Descriptive Geometry	١	١						٣	٢		
ME 113	Principles of Manufacturing Processes	٢	٣	٢	١					٢		٢
ME 103	Electrical Engineering I	3	٣			٢				٢		١
ME 121	Human Rights and Democracy						١				١	
ME 122	English Language							٣		١		
ME 201	Mathematics II	3		1	1							١
ME 202	Computer Programming II	1			3	1		٢	٢	٢		١
ME 211	Fluid Mechanics I	3	٢	3	٢	٣	٢	١	٣	١		
ME 212	Engineering Metallurgy	1	١		٢				١			
ME 213	Strength of Materials	3		3	2	1	3		1	2		
ME 214	Mechanical Drawing			2	٢	١		٣	٢	2		
ME 215	Engineering Mechanics II	3		2		3			3	2		
ME 216	Thermodynamics	3	2	3	2	2	2	1	3	2		
ME 221	Principles of Democracy						١				١	
ME 301	Engineering & Numerical Analysis	3			٢			٢		٢		٢
ME 302	Electrical Engineering II	3	٣			٢				٢		١
ME 313	Mechanics of Machines	٣	٢	٣	٢	٣	٢	١	٣	١		
ME 311	Heat Transfer	3	٢	3	٢	٣	٢	١	٣	١		
ME 312	Internal Combustion Engines	3	٢	3	٢	٣	٢	١	٣	١		
ME 314	Fluid Mechanics II	3	٢	3	٢	٣	٢	١	٣	١		
ME 315	Manufacturing Processes	٢	٣	٢	١					٢		٢
ME 321	Industrial Management	١	١		٢		٢	١	٢	٢		
ME 316	Mechanical Engineering Lab II	٢	٣	٢	٢			٢		٢		
ME 411	Machine Design	٣	٢	٣	٣	٣	٢	٢	٣	٢		
ME 412	Control & Measurements	٣	٢	٣	٣	٣	٢	١	٣	٢		
ME 413	Refrigeration & Air Conditioning	٣	٢	٣	٣	٣	٢	١	٣	٢		
ME 402	Industrial Engineering	١	١		٢		٢	١	٢	٢		
ME 414	Vibrations	٣	٢	٣	٢	٣	٢	١	٣	١		
ME 415	Power Plants	٣	٢	٣	٢	٣	٢	١	٣	٢		
ME 416	Engineering Materials	٢	٢		٢		٢	١	٢	٢		
ME 417	Engineering Project	٣	٣	٣	٣	٣	٣	٣	٣	٣	٣	٣
ME 418	Mechanical Engineering Lab III	٢	٣	٢	٢			٢		٢		

Key		
		No Emphasis
	1	Very Little Emphasis
	2	Moderate Emphasis
	3	Strong Emphasis

6.4 Program Delivery and Assessment Methods

The Department adopts the traditional teaching-learning method. The method includes the use of classroom instruction, tutorials, assignments, conducting lab experiments, short projects, seminar presentation and attendance, industrial visits and summer training programs and final-year graduation projects. On the other hand, students are assessed through various modes such as examinations, assignments, quizzes, oral presentations, reports, and class participation.

6.5 Continuous Improvement

The Department of Mechanical Engineering has within its organizational structure a Curriculum Committee formed of the most high-ranked and experienced academic staff of the Department whose task is to propose changes and improvements to the curriculum by a limited percentage based on surveys of alumni, industry and employers feedback. Results of the assessments of program outcomes will be incorporated in reviewing and improving the program curriculum. Changes or modifications to the curriculum must be justified and subject to the approval of the Ministry of Higher Education and Scientific Research.
No changes or modifications to the current curriculum have yet been made.

6.6 SWOT Analysis

Strengths (Internal)	**Weaknesses (Internal)**
• Designed to meet the local needs and international standards • Adequate engineering science components • Adequate delivery and assessment processes	• Central control of curriculum development • Number of experienced staff
Opportunities (External)	**Threats (External)**
• The possibility of utilizing new teaching-learning methods	• Quality of students (lack of enthusiasm and learning ambition)

6.7 Action Planning

Objectives: To remedy the shortcomings mentioned in the SWOT analysis only the lack of experienced staff may be considered by the Department.

Action Plans

- Nomination of eligible junior faculty members as Ph. D. candidates to the available scholarships, fellowships and leaves of absence opportunities.

Key Performance Indicator

- One Ph. D. candidate through government scholarship has joined the program in USA.
- Appointment of a lecturer and an assistant lecturer

Targets and timelines:

- The targeted timeline for having sufficient number of faculty with Ph. D. qualification 2020.
- It is expected that by 2017 all the current candidates will be back.

7. FACULTY

7.1 Strength of the Academic Staff

The number of academic staff , their academic qualifications and ranks including those who are on study leaves are shown in Table 7.1 for the academic years 2010/2011 and 2011/2012.

Table 7.1 Size of Academic Staff

Academic Rank	Qualification	2011/2012		2012/2013	
		Appointment	Contract	Appointment	Contract
Asst. Professor	Ph. D.	3	-	2	-
Lecturer	M. Sc.	2	-	3	-
Asst. Lecturer	M. Sc.	9	4	10	4
Total		18		18	

7.2 Details of Academic Staff Experience

This article describes the qualifications, posts, experience and areas of specialization of the academic staff of the Department of Mechanical Engineering. The details are shown in Tables 7.2 and 7.3.

Table 7.2 Details of Staff (Permanent Base)

Staff Name	Qualification	Position	Area of Specialization	Year of first appointment or transfer to University service
Muthanna K. Hassan	Ph. D.	Asst. Prof., Dean	I.C. Engines	13/1/1992
Mahmood K. Mawlood	Ph. D.	Asst. Prof. Head of ME Dept.	Thermo-Fluids (CFD)	2/1/1978
Mahmood H. Ali	M. Sc.	Lecturer	Thermal Power	24/1/2002
Ayad F. Hameed	M. Sc.	Lecturer	Fluid Dynamics	2012
Imad M. Siddiq	M. Sc.	Asst. Lecturer	Refrigeration and Air Conditioning	2012
Omed A. Abbas	M. Sc.	Asst. Lecturer (on study leave)	Thermal power	22/1/2006
Falah N. Ahmed	M. Sc.	Asst. Lecturer	Electronics	7/6/2005
Maryam M. Fatih	M.Sc.	Asst. Lecturer	Laser Communication	19/2/2006
Sarteep L. Hassan	M. Sc.	Asst. Lecturer	Applied Mechanics	20/8/2003
Abbas M. Ismaeel	M. Sc.	Asst. Lecturer	Heat Transfer	6/6/2011
Taymoor C. Khidir	M. Sc	Asst. Lecturer	Applied Mechanics	5/1/2012
Rawand I. Jalal	M. Sc.	Lecturer (on study leave)	Hydraulic Control	28/11/2005
Ali H. Abdulkareem	M. Sc.	Asst. Lecturer (on study leave)	Heat Transfer	5/5/2009
Mustafa W. Qanber	M. Sc.	Asst. lecturer (on study leave)	Fluid Dynamics	22/12/2005
Omer A. Zainal	M. Sc.	Asst. Lecturer (on study leave)	Air Conditioning	14/11/2002

Table 7.3 Staff Details (Contract base)

Staff Name	Qualification	Area of Specialization	Year of contract
Muhsin Mar'ee	M. Sc.	Applied Mechanics	2012/2013
Usama B. Hmood	M. Sc.	Thermal Power	2011/2012
Qusay K. Jassim	M. Sc.	Heat Transfer	2011/2012
Omer F. Rifaat	M. Sc.	Electric Control	2011/2012

7. 3 Staff Workload

The teaching load is distributed according to the academic rank of a staff member. The maximum load (class hours/week) assigned to a staff member is limited by University regulations as shown in Table 7.4. A staff member taking extra load is entitled for additional payment. Administrative duties assigned to the staff reduce the maximum teaching load. Table 7.5 shows the teaching load of the ME staff for the academic year 2012/2013.

Table 7.4 Maximum Teaching Load Distribution

Academic Rank	Professor	Asst. Prof.	Lecturer	Asst. Lecturer
Maximum Load (hrs/week)	6	8	10	12

Table 7.5 Teaching Load for the Academic Year 2012/2013

Name and position	Program	Coarse Code Taught	Total hrs/week	Extra hrs/week
Asst. Prof. Dr. Muthanna K. Hassan, Dean	ME	-	0	0
Asst. Prof. Dr. Mahmood K. Mawlood, Head of ME Dept.	ME	ME 314, ME 316	6	2
Mahmood H. Ali, Department Reporter	ME	ME216, ME311, ME316	12	6
Ayad F. Hameed, Lecturer.	ME	ME211, ME312, ME316	12	2
Falah N. Ahmed, Asst. Lect.	ME	ME 122, ME103, ME321	14	4
Imad M. Siddiq, Asst. Lect.	ME	ME201, ME217	18	6
Sarteep L. Hassan, Asst. Lect.	ME	ME213	6	0
Abbas M. Ismaeel, Asst. Lect.	ME,	ME112, ME214	18	6
TaymUr C. Khidir, Asst. Lect.	ME	ME215,ME313, ME316	18	**6**
Muhsin H. Mar'ee	ME	ME112, ME315	12	0
Usama B. Hmood (Contract)	ME	ME 113, ME301	12	0
Qusay K. Jassim (Contract)	ME	ME111, ME212	12	0
Omer F. Rifaat (Contract)	ME	ME302	12	0

Code: ME: Mechanical Engineering, CE: Civil Engineering, PE: Petroleum Engineering

7.4 Staff-Student Interaction

Staff from ME department are members in the Student Advising Unit at the College level meet students regularly to advise in academic matters, assist with personal problems, resolve any faculty/student conflict and student related affairs. Students also meet their lecturers regularly during consultation hours for discussion of academic matters and solving problems.

7.5 Staff Performance Rating

It has been mentioned already that the performance of the academic staff is rated by the Head of the Department and approved by the Dean of the College according to the forms shown in Appendix I. In addition to that, students are also involved in the process of rating of the staff and the program. Sample questionnaire is included in Appendix I.

7.6 Staff Professional Development

The general policy of the University is to encourage the staff to take part in the various activities for staff professional development such as attending professional conferences, training workshops and conducting high standard researches.
Technical and supporting staff also motivated to upgrade their expertise by attending short courses offered by the various educational institutions and universities in Iraq.
The following programs are available for staff professional development:

a. Fellowships, Scholarships and Study Leaves

Junior academic faculty members are supported through fellowships, scholarships and study leave programs to pursue their studies towards Ph.D. degrees. Supporting staff with B. Sc. degrees are also assisted through study leaves to attend M. Sc. programs in Iraqi universities.

b. Sabbatical Leaves

This opportunity may be offered to staff members having service periods of more than fife years and.

c. Pedagogical Training Center

The Center is under the administration of the College of Education and offers short pedagogical courses to newly appointed staff at the University whose appointment is provisional for the first year of their service.

7.7 Student to Staff Ratio

Table 7.6 shows the student to staff ratio of the department for the academic years 2011/2012 and 2012/2013

Table 7.6 Student to Staff Ratio

Acad. year	Student/ Prof.	Student/ Asst. Prof.	Student/ Lecturer	Student/ Asst. Lect.	Student/ Total Staff
2011/2012	-	34:1	51:1	11.3:1	7.3:1
20122013	-	85:1	56.6:1	17.5:1	11.3:1

7.8 SWOT Analysis

Strengths (Internal)	Weaknesses (Internal)
• Dedicated young staff • Enthusiasm towards building reputable Department • Encouraging salaries and wages • Reasonable number of scholarships and study leaves for improving the faculty • Good social relationship among staff	• Increasing proportion of new faculty with inadequate teaching experience • Limited research experience • Poor relationship with international research centers and academic institutions • Inadequate funding for participation in international conferences and workshops • Inadequate funding for research
Opportunities (External)	**Threats (External)**
• Available faculty development opportunities	• Political instability of the country • Poor security and terror acts against the faculty • Quality of incoming students

7.9 Action Planning

Objectives: The Department endeavors to remedy the shortcomings in the quantity and quality of the faculty by utilizing every possible opportunity. The main objective of the program is to have a sufficient number of faculty with Ph. D. degrees

Action Plans

- Nomination of eligible junior faculty members as Ph. D. candidates to the available scholarships, fellowships and leaves of absence opportunities.

Key Performance Indicator

- One Ph. D. candidate through government scholarship has joined the program in USA.
- Appointment of a lecturer and an assistant lecturer

Targets and timelines:

The targeted timeline for having sufficient number of faculty with Ph. D. qualification, is 2020.

Expected dates for the Department to have its present candidates back with the required qualifications are 2013 to 2017.

8. FACILITIES

8.1 Faculty Offices

The Department of Mechanical Engineering has only three offices located in the main building of the College of Engineering occupied by the faculty members and the head of the department. Due to insufficient office rooms some of the junior staff and teaching assistants occupy the available spaces in the labs.

8.2 Lecture and Drafting Halls

There are 13 lecture rooms in the College of Engineering common to all the three departments. Students of the ME Department mainly occupy two of the lecture rooms. Lecture rooms are equipped with white boards as the main instruction tool. The lecture rooms occupied by the ME students are further equipped with data show facilities. The College has only one common drafting hall used by all the three Departments. Table 8.1 shows the area and number of students per lecture hall.

Table 8.1 Lecture Rooms Used by ME Department

Lecture room No.	Area m^2	Max. number of seats
1	40	36
2	40	36
10	70	60
Drafting Hall (Common)	70	45

8.3 Laboratories

As a new department, the ME department strives to build and innovate its laboratories by purchasing new lab and workshop equipments through the budgets allocated for the College of Engineering. A contract amounting to more than 2000 Million ID for supplying new lab equipments to the ME department was signed late 2011 and currently is under pursuance. More than 80% of the contract equipments have already been supplied including workshop machines, fluid mechanics, heat transfer, thermodynamics and applied mechanics lab equipments. Table 8.2 lists the currently available and used labs and Table 8.3 lists the number of lab equipments to be supplied through the mentioned contract.

Table 8.2 Currently available laboratories

Laboratory	Area m^2	Number of equipments available	Capacity (number of students/session)
Workshop	144	24	25-30
Fluid Mechanics	78	8	15-20
Strength of Materials	50	8	10-15
Electrical Engineering	50	47	10-15

Table 8.3 Lab Equipment Supplied 2012/2013

Type of Equipment	Number of equipments
Workshop	33
Fluid Mechanics	17
Heat Transfer	11
Thermodynamics and IC Engines	16
Theory of Machines and Vibration	18
Metallurgy	6

8.4 Information Resources

The ME department provides the students with all the recommended text books for all the courses taught. For this purpose the department has a book store which currently contains about 1500 text books. The number of text books and their editions are updated periodically by purchasing new and additional text books through the annual budget allocated by the University for this purpose. In addition to the text books reference books and periodicals in the various areas of engineering are available at the University and the College libraries.

a. The University Central Library

The University Central Library is located at the University Cultural Center building. Students at various levels and university staff members from all the colleges of the university can access the available reference books and periodicals in their area of interest in this library.

b. The College Library

The College Library is located in the College of Engineering campus and contains a collection of more than 4000 books in the various engineering areas. It contains more than 900 reference books in Mechanical Engineering only. Currently no periodicals are available in this library. Students and the teaching staff regularly approach the College Library for searching and borrowing books.

8.5 SWOT Analysis

Strengths (Internal)	Weaknesses (Internal)
• Building of two additional lecture halls • Adequate budget for purchasing lab equipments • Adequate budget for purchasing textbooks and reference books • Adequate space of existing labs • Labs and lecture halls located in the College of Engineering campus	• Small and insufficient office rooms • Insufficient number of lecture halls • Inadequate space of lecture halls • Insufficient number of drafting hall and inadequate space of the existing one • Insufficient number of lab halls • Lack of well equipped seminar halls • Inadequate space of the College Library
Opportunities (External)	**Threats (External)**
• Completion of the infrastructure of the new Campus project • Shifting to the new campus by the end of this academic year	• Very slow execution of the new Campus Project. • Admission of large number of transfer students

8.6 Action Planning

1. Objective(s):

The objective is to remedy the weaknesses of the program. The main weakness of the program is the available space.

2. Action Plan:

The department is ready to shift to the new campus by October 2013. The space problem will be totally resolved.

3. Key Performance Indicator:

Building of two lecture halls

4. Targets and timelines:

Shifting timeline to the new campus is October 2013.

9. INSTITUTIONAL SUPPORT

9.1 Program Leadership

The program is led by the Departmental Board and the various Department committees. The Departmental Board is chaired by the Head of the Department. Asst. Prof. Dr. Mahmood K. Mawlood serves as the Head of the Department since the foundation of the Department in 2010/2011.
Mr. Rawand I. Jalal served as the Department coordinator and reporter till Feb. 2012. After joining his Ph. D. program the duty was assigned to Mr. Mahmood H. Ali.
The Examination Committee consists of Asst. Prof. Dr. Mahmood K. Mawlood as chair of the committee and Mr. Mahmood H. Ali, Mr. Falah N. Ahmed, and Mr. Tymor K. Choban as members.
The Scientific and Curriculum Committees consist of Asst. Prof. Dr. Mahmood K. Mawlood, Mr. Ayad F. Hameed and Mr. Mahmood H. Ali.
The Student Affairs Committee consists of Mr. Mahmood H. Ali, Miss. Sanaa Fadhil and Mrs. Inji Abdulhakeem.

9.2 Program Budget

The program budget is part of the budget allocated for the College of Engineering. The budget is usually allocated by the University according to the available overall budget allocated by the Ministry of Higher Education and Scientific Research.
The College Board is responsible for the allocation of the College budget.
Appendix IV shows the amounts allocated by the University for the College of Engineering for the year 2012/2013

9.3 Infrastructure Development Resources

a. Annual Budget of the College: It is the main resource and as stated above is allocated by the University. In addition to the salaries and wages of the whole manpower it covers a variety of categories including lab equipments and materials, furniture, building rehabilitation, maintenance of appliances and books.

b. Petrodollar Projects: Available funds from petrodollar are controlled and allocated by the local governorate. Allocations given to the University are expended to projects proposed by the Colleges and Departments of the University.

9.4 Faculty Appointment

The Department needs for faculty are discussed every year by the Department Board and presented to the University through the Dean of The College of Engineering.
The process of appointment of a faculty member takes place according and subject to the following:
a. Availability of vacant position grade together with its budget allocation.
b. Approvals of the Head of the Department and the Dean of the College.
c. Passing the pedagogical training course and fitness test
d. Provisional appointment period of one year.

9.5 SWOT Analysis

Strengths (Internal)	Weaknesses (Internal)
• Adequate salaries and wages • Adequate budget for purchasing lab equipments and materials • Adequate budget for purchasing textbooks, reference books and stationeries	• Complicated route of appointing or hiring of manpower • No funds for starting scientific research • No funds for dispatch of faculty to conferences • No funds for professional development
Opportunities (External)	**Threats (External)**
• Petrodollar projects	• Instability of the political situation

9.6 Action Planning

Not applicable.

10. PROGRAM BUDGET

10.1 Process of Expenditure

The budget allocated for the College of Engineering against the categories: Appliances, Lab equipments and materials, Furniture, Books and Stationeries is expended according to the needs of the departments and units of the College.
Committees formed at the College level are responsible for the process of purchasing of items within a cost limit of (10,000,000) Iraqi Dinar. If the cost exceeds this amount the purchase is subject to a bidding process based on at least three quotations from different suppliers. If the estimated cost exceeds (100,000,000) Iraqi Dinar the bidding will be performed centrally by the University. The Department submits lists of the various needed items to the Dean of the College for approval. Approved requests are passed to the relevant committee to accomplish the purchase according to the cost ranges mentioned above.

The allocated budget amounts for the College of Engineering are shown in Appendix IV.

10.2 Expenditure Level

Expenditure level can only be determined by the end of the fiscal year.

10.3 Scientific Research and Professional Development of the Faculty

No funds are allocated by the University for starting up of scientific researches or professional development of the faculty. The amount of the budget allocated for scientific activities are shown in Table 9.1 and the amounts allocated for faculty professional development are shown in Table 9.2.

Table 9.1 Scientific Research Budget

No	Paragraphs of the financial field	Amount in Iraqi Dinar
١	The total amount allocated by the University for the Collage for purchase of books, periodicals and references	١٧٩٩٩٠٠٠
٢	The total amount allocated by the University for the Collage for conferences and seminars	٩٦٢٠٠٠
٣	The total amount allocated by the university for the collage for postgraduate studies	٦٠٦٧٥٤٦٠

Table 9.2 Budget allocated for faculty professional development

No	Paragraphs of the financial field	Amount in Iraqi Dinar
١	The total amount allocated by the University for the College for the purchase of books, periodicals and reference books	١٧٩٩٩٠٠٠
٢	The total amount allocated by the University for the Collage for conferences and seminars	٩٦٢٠٠٠
٣	The total amount allocated by the University for the Collage for the purposes of scientific research and postgraduate studies	٦٠٦٧٥٤٦٠
٤	The total amount allocated by the University for the College to train academic and administrative staff	٩٧٥٠٠٠
٥	The total amount allocated by the University for the College for the purposes of other expenses (such as festivals, scientific or technical exhibition	٢١١٣٢٥٠
٦	The total amount allocated by the University for the College to scientific dispatch	١٢٥٩٠٠٠٠
٧	The total amount allocated by the University for the College to purchase of textbooks	٢٨٨٢٥٠٠٠

10.4 SWOT Analysis

Strengths (Internal)	Weaknesses (Internal)
• Adequate salaries and wages • Adequate budget for purchasing lab equipments and materials • Adequate budget for purchasing textbooks, reference books and stationeries	• Complicated process of purchasing • No funds for starting scientific research • No funds for dispatch of faculty to conferences • No funds for professional development
Opportunities (External)	**Threats (External)**
• Petrodollar projects	• Instability of the political situation

10.5 Action Planning

Not Applicable

11. SCIENTIFIC RESEARCH

11.1 Research Strategies

As a newly founded department, presently the ME Department has no strategies in planning and carrying out scientific research. The faculty members individually plan their own researches to enhance and broaden their knowledge in the areas of their interest or specialization. The Unit of Scientific Affairs of the College of Engineering and the Deputy Dean for Scientific Affairs is in charge of administering and following the performance of the staff and the levels of accomplishment of the planned researches.

11.2 Program Support

The program mission to disseminate the most modern science and engineering knowledge in the area of mechanical engineering can be achieved through the teaching process of the program's courses and publishing quality researches. The ME Department through its Departmental Board and the Head of the Department encourages the staff members to conduct and publish their researches in local and international reputable scientific journals and take part in the national and international conferences and symposiums held in the Country and abroad.

11.3 Research Administration

The Unit of Scientific Affairs linked with the Deputy Dean is responsible for administering research activities at the College level. The staff members are individually required to formally inform this Unit about the research they intend to carry out. A form to be filled by the individuals and submitted to this Unit includes the title of the research, names of participants and their affiliations, date of commencement, expected timeline for accomplishment and a brief abstract.

11.4 Research and Teaching Relationship

Usually the staff members are involved in teaching the course subjects that are closely related to their fields of interest or specializations. For staff evaluation and promotions the general policy of the University and the College of Engineering is that the staff members should conduct research and publish in the area of their specializations. Thus conducted researches will definitely enhance and broaden the knowledge of an individual staff member which will be reflected to his/her teaching outcome.

11.5 Postgraduate Studies

The College of Engineering including all its three Departments runs undergraduate programs. Postgraduate studies have not been planned yet.

11.6 Financial Support

No budget is allocated for research.

11.7 International Publication

Presently, the Department of Mechanical Engineering has no international publications.

11.8 SWOT Analysis

Strengths (Internal)	Weaknesses (Internal)
• Dedicated staff • Enthusiasm towards building reputable Department	• Limited research experience of the faculty • Poor relationship with international research centers and academic institutions • Inadequate funding for participation in international conferences and workshops • Inadequate funding for research
Opportunities (External)	**Threats (External)**
• Appointment of qualified staff • Building relationships with local industry and international research centers	• Political instability of the country • Poor security and terror acts against the faculty

11.9 Action Planning

Objectives: The Department endeavors to remedy the shortcomings in research experience of the faculty. The main objective of the program is to have a sufficient number of faculty with Ph. D. degrees

Action Plans

- Nomination of eligible junior faculty members as Ph. D. candidates to the available scholarships, fellowships and leaves of absence opportunities.

Key Performance Indicator

- One Ph. D. candidate through government scholarship has joined the program in USA.

Targets and timelines:

The targeted timeline for having sufficient number of faculty with Ph. D. qualification is 2020.

Expected dates for the Department to have its present candidates back with the required qualifications are 2013 to 2017.

12. EXTERNAL RELATIONS

According to the regulations, the Department is not authorized to have relations of any kind with any external institution.