Self Assessment Report
of
Mechanical Engineering Department

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Introduction
Program History

The Mechanical Engineering Department was established during the establishment of the college of engineering at 2006.
The Department aim to prepare qualified Mechanical engineers with theoretical and practical background to practice their specialist and contribute to the implementation of developing plan.
Introduction

Title Degree
The Department of Mechanical Engineering offers, namely Bachelor of Science in Mechanical Engineering.

Program Delivery Modes
The Mechanical Engineering program is a four year on-campus offered during daytime every day except Friday and Saturday, and with traditional lecture/ laboratory course style.
Introduction

Organizational Structure

Dean

Head of Department

Department Council

Department Coordinator

Laboratories

Employees

Scientific Committee

Examination Committee

Secretary

Electrical Lab.

Fluids Lab.

Heat Transfer Lab.

Thermodynamics Lab.

Theory of Machines Lab.

Electrical machines Lab.

Programming Lab.

Strength of Materials Lab.

Air-Conditioning Lab.

Power Lab.

Measurements Lab.

Control Lab.

Internal Combustion Engines Lab.
Program Educational Objectives
Mission of Program

Achieving excellence in mechanical engineering education and scientific research in accordance with the requirements and standards of the Quality Management in order to achieve the best service related to mechanical engineering.
Program Educational Objectives

The Program Educational Objectives are

a) Instilling a sense of responsibility as professional member of society.
b) Prepare the Mechanical Engineering Students to have effective workplace skills.
c) Prepare the Mechanical Engineering Students to have the ability for designing systems, components, or processes to meet desired needs within realistic constraints such as economic, environmental, social, political, ethical, health and safety, manufacture ability, and sustainability.
d) The broad area of education is necessary to understand the impact of the engineering solutions in a global, economic, environmental, and societal context.

e) An ability to use the techniques, skills, and the modern engineering tools necessary for engineering practice
The mapping of Mechanical Engineering Courses with the program educational objectives

<table>
<thead>
<tr>
<th>Year</th>
<th>Code</th>
<th>Subject</th>
<th>Object</th>
</tr>
</thead>
<tbody>
<tr>
<td>First Year</td>
<td>ME1101</td>
<td>Human Rights</td>
<td>x</td>
</tr>
<tr>
<td></td>
<td>ME1202</td>
<td>Mathematic I</td>
<td>x</td>
</tr>
<tr>
<td></td>
<td>ME1203</td>
<td>Programming I</td>
<td>x</td>
</tr>
<tr>
<td></td>
<td>ME1204</td>
<td>Engineering Mechanics I</td>
<td>x</td>
</tr>
<tr>
<td></td>
<td>ME1205</td>
<td>Engineering Drawing and Descriptive Geometry I</td>
<td>x  x</td>
</tr>
<tr>
<td></td>
<td>ME1206</td>
<td>Electrical Engineering</td>
<td>x</td>
</tr>
<tr>
<td></td>
<td>ME1207</td>
<td>Manufacturing Processes I</td>
<td>x  x</td>
</tr>
<tr>
<td></td>
<td>ME1208</td>
<td>Workshop Training</td>
<td>x</td>
</tr>
<tr>
<td></td>
<td>ME1309</td>
<td>English Language</td>
<td>x</td>
</tr>
</tbody>
</table>
Strength points

The mission of Mechanical Engineering Department is clear and specific, and it’s reflecting the public and private vision of educational objective.

Consistency the program educational objective with the missions of college and university.
Weakness points

The lack of an internal audit system of plans for continuous improvement purposes

Inaccuracy the results of questionnaires
Opportunities points

- Community Service is the main item of the department’s mission.
- Continues training and short courses can be used to increase the impact of the department’s mission.

Threats points

- Absence of Industry Advisory Committee
TOWS Strategy

External environments

Opportunities

SO
"Maxi-Maxi" Strategy
Strategies that **use strengths** to maximize opportunities

ST
"Maxi-Mini" Strategy
Strategies that **use strengths** to minimize threats.

Weaknesses

Internal environments

Strengths

WO
"Mini-Maxi" Strategy
Strategies that **minimize weaknesses** by taking advantage of opportunities.

WT
"Mini-Mini" Strategy
Strategies that **minimize weaknesses** and avoid threats.
Program Educational Objectives

- Using the modern tools and techniques in order to improve the educational objective.
- Seriousness in implementation of the college mission and goals by the academic staff.

TOWS Strategy

**External environments**

Opportunities

Threats

**Strengths**

- "Maxi-Maxi" Strategy
  - Strategies that use strengths to maximize opportunities

- "Maxi-Mini" Strategy
  - Strategies that use strengths to minimize threats.

**Weaknesses**

- "Mini-Maxi" Strategy
  - Strategies that minimize weaknesses by taking advantage of opportunities.

- "Mini-Mini" Strategy
  - Strategies that minimize weaknesses and avoid threats.
Student and Assessment
Students Admission

- He/ She should have an Iraqi secondary school certificate.
- Acceptance is centrally controlled by the Ministry of Higher Education and Scientific Research.
- The central acceptance Department in the Ministry of Higher Education manage the process of students distribution based on these factors:
  - The adoption of plans which supplied universities to identifying the number of students suggested by College.
  - Total scores for Admired students.
  - Choice of the Students.
After the distribution of applicants among the universities/colleges, the registration of all students in the college were completed and then they distributed to the scientific departments, according to the following mechanism:

- Selection of the student for the desire department.
- Total scores of student.
- The capacity of the department
- Advantage provided to the student who his/her father or mother is a member of academic staff that allow the admit student to select any department in the accepted college.
• Also included a plan to accept the 1st graduate in each department from Technical Institutes Foundation, and the distinguished employees from state institutions and ministries.
• The applicant must submit the required documents within a registration period.
• Adding to that; development of temporary plan to enable the student to study in the area of residence because of the security situation and during only one year under certain conditions, called hosting.
Since 2006-2007, Mechanical Engineering Program enroll new students as shown in Chart below.
Evaluating Student Performance

The assessment processes are done by:

- **Course Assessments**
  
  During the period of students study in the department, there is an assessment procedure through:
  
  - Daily examinations and Quizzes.
  - Follow-up homework.
  - First and second exams semester.
  - Final Exam

- **Summer Training**
- **Senior Project**
Graduation Requirements
To be awarded the degree of Bachelor of Science in Mechanical Engineering a student must complete the required mechanical engineering curriculum as shown in Chart below:
Student and Assessment

SWOT Analysis

1. Strength points
   
   • Admitted students in the lists of the central admissions have good scientific level because the competition among them is based on the total scores obtained by the student at the examinations of the secondary study.
   
   • Attend lectures well by students.
   
   • Development the hosting plan at universities closes that to the students’ dormitory because of poor security situations.
SWOT Analysis

2. Weakness points

- Some of students were admitted without their desires, but accepted according to their total scores.
- Due to the security situation in the city, the students gets delayed in the presence in the early hours, as well as the studying hours are limited for specific period of the day which affects the performance of students.
- The college suffers from some students who have low level of education because of the laws of return terminated students and complementary examinations.
Student and Assessment

SWOT Analysis

2. Weakness points

- The laws of subject transfer for students who move to the next stage with one or two fail subjects belonging to the current stage and that causes some difficulties to cover the scientific subjects for all substances which affect the performance of the students.
SWOT Analysis
3. Opportunities points

- The cancellation of exceptions and supplementary examinations and crossing instructions.
- Determine the degree of subjects (English, mathematics, and physics) to be as competitive lessons at the acceptance.
- Supporting outstanding students to perform summer training in special work sites in foreign countries.
- Employing of the first three graduated student to be an incentive for competition among them.
- Assignment one day in week or month to offer a services for civilian society
4. Threats points

- The graduate students suffer from frustration because of the working difficulties in departments or companies that can develop their theoretical study in the field of work due to nepotism in appointments of state institutions.
- Female to male ratio is almost half.
Student and Assessment

TOWS Strategy

1. SO:
   - Attending lectures must have a great part in evaluation of students’ performance.
   - Adding additional degrees to the average at application for students whom have 100% scores in competitive subjects.
   - Encourage the students to make researches during their study period for government departments.
TOWS Strategy

2. **ST:**
   - Arrangement the employment process with the help of the ministry of delineating especially for students has the high level in graduation.

3. **WO:**
   - Facilitate a free transition for student to facilitate attending lectures.
   - Application must be depend on the scores of competitive subject in spite of the score of average.
   - Improve the academic level for the students by using competitive lessons.
TOWS Strategy

4. WT:

- Replace the laws of return terminated students and complementary examinations by transition them to another lower level college.
- Equivalence the chance of male and female in application.
Staff and Facilities
Faculty Competencies
The distribution of Mechanicals' faculty according to their majors is shown below
Faculty Size
The Ranks of Mechanical Engineering Faculty

![Bar chart showing the ranks of mechanical engineering faculty. The chart indicates the number of professors, assistant professors, lecturers, and assistant lecturers. The chart compares the number of Ph.D. and M.Sc. holders in each rank.]
## Staff and Facilities

### Offices (Administrative, Faculty, Secretary)

<table>
<thead>
<tr>
<th>Office Name</th>
<th>No.</th>
<th>Area</th>
</tr>
</thead>
<tbody>
<tr>
<td>Department Chair</td>
<td>1</td>
<td>76.54 m²</td>
</tr>
<tr>
<td>Department Secretary</td>
<td>1</td>
<td>50.04 m²</td>
</tr>
<tr>
<td>Faculty offices</td>
<td>6</td>
<td>20.1 m² (each one)</td>
</tr>
<tr>
<td>Examination committee</td>
<td>1</td>
<td>39.22 m²</td>
</tr>
</tbody>
</table>

### Classrooms

<table>
<thead>
<tr>
<th>Classroom</th>
<th>No.</th>
<th>Area (each one)</th>
<th>Seating capacity (each one)</th>
</tr>
</thead>
<tbody>
<tr>
<td>First Class</td>
<td>2</td>
<td>75.96 m²</td>
<td>50 Students</td>
</tr>
<tr>
<td>Second Class</td>
<td>2</td>
<td>75.96 m²</td>
<td>50 Students</td>
</tr>
<tr>
<td>Third Class</td>
<td>1</td>
<td>75.96 m²</td>
<td>50 Students</td>
</tr>
<tr>
<td>Fourth Class</td>
<td>1</td>
<td>75.96 m²</td>
<td>50 Students</td>
</tr>
</tbody>
</table>
### Staff and Facilities

## Laboratories

<table>
<thead>
<tr>
<th>Lab. Name</th>
<th>Course covered by this Lab.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Air Conditioning Lab.</td>
<td>ME4303</td>
</tr>
<tr>
<td>Machines Theory Lab.</td>
<td>ME3304</td>
</tr>
<tr>
<td>Thermodynamics Lab.</td>
<td>ME2307</td>
</tr>
<tr>
<td>Electricity Lab.</td>
<td>ME1206, ME3308</td>
</tr>
<tr>
<td>Fluids Lab.</td>
<td>ME2306, ME3306</td>
</tr>
<tr>
<td>Computer Lab.</td>
<td>ME1203, ME2203, ME3307</td>
</tr>
<tr>
<td>Drafting Lab.</td>
<td>ME1205, ME2305</td>
</tr>
</tbody>
</table>

## Library

The college has one center library of 346.33 m² area, and has variety of hard and soft copy in Mechanical Engineering profession, as well as an internet services to the students.
Staff and Facilities

IT and Computer Resources

• The Students and faculty are benefit from the availability of free Internet in the library
• The department gives laptops with excellent hardware specifications to all faculty members and provides a wireless internet service inside the department space.
• The intranet project reach its final stage; that ensure the connection of all computers in the college with each other, and provide a lot of service such as E-mail, E-library, and backups of important files and students matters.
• Development the storage system by decoding all items with a barcodes
SWOT Analysis
1. Strength points
   - All faculty members have a team work spirit and have the ability for progressing.
   - Most of faculty members are young.
   - The available classrooms and laboratories are sufficient for the needs of the college at this time.
   - Usage of modern teaching aids such as smart boards.
SWOT Analysis

2. Weakness points

- Lack of academic staff.
- The limitation of some Mechanical Engineering specialization.
- The limitation of High degree and ranks, such as Ph.D. degree, and Prof., Asst. Prof ranks.
- The salary of faculty is low in comparison with the others faculty in foreign countries.
- The university did not offer the community benefits such as housing, health care and children care.
- Lack of research due to the absence of financial support, and laboratories.
2. Weakness points

- The decrement in financial support from the ministry of higher education and scientific research.
- The limitation speed of the internet services.
- Lack of faculty cafeteria.
- The limitation of international journals.
SWOT Analysis

3. Opportunities points

- Supporting the research by university, college and other ministries.
- Training abroad to increase the experience.
- Higher Education such as Ph.D. studies.
- Increase the rate of staff employment.
- There is a project of constructing a new building dedicated for mechanical engineering department.
SWOT Analysis

3. Threat points

- Increase the frustration among the faculty due to the busyness with the life requirements.
- Increase the desire to removal to other ministries due to the relative high salaries.
- Graduation the engineers with a low levels of skills.
- Decrement the working life of the machines and instruments due to bad use of unprofessional persons.
TOWS Strategy
1. SO:
   - Expedition a team works to training or proceeding specific researches to increase the scientific benefits.
   - Increase the communication with other foundations and ministries to organize a scientific research or consults groups.
   - Make the scholarship more specific toward the department objectives.
   - The dependence of the best original manufacturing of the instruments and machines.
TOWS Strategy

1. SO:
   - Increase the lecturer to student ratio to increase the benefit of these facilities.
   - Assurance upon the development of offices, classroom, laboratories and library.

2. ST:
   - Increase the financial assignation to common researches rather than single.
   - Obtaining the higher degrees (Ph.D.) with more specific major in Mechanical Engineering area to cover the department curriculums.
Staff and Facilities

TOWS Strategy

2. ST:

• Continuation the graduates for one year when he/she employs and submits to common evaluation from the department and the employers.
• Training the staff of the laboratories through continues training programs.
• Providing all faculties rooms with the internet service.
TOWS Strategy

3. WO:

- Increase the financial support of researches.
- Acquittal the faculty from the costs of continues teaching and training.
- Using the experiences of the professional staff to put a scientific plan of progressing, training, and installation the internet systems.
Staff and Facilities

TOWS Strategy

4. WT:

- Increase the salary of the faculty to provide all life requirements.
- Establish free centers for children and health care.
- Insurance on faculty’s life.
- Establish a housing with a low costs.
- Increasing the financial support especially laboratories, engineering project and summer training, and scientific researches
Curriculum
Courses Description
At the beginning the Courses were coded as illustrated

ME
- Mechanical Engineering

X
- 1- First Year
- 2- Second Year
- 3- Third Year
- 4- Fourth Year

Y
- 1- University requirements
- 2- College requirements
- 3- Department requirements

ZZ
- 01,02,03, Consequence of the courses in academic year
Curriculum Review
All the courses are broken into categories; University, College, and Department Requirements, as shown below.
and also broken down by years, and extracted from that the theoretical, Lab, and tutorial hours of courses along with their units as shown.
Curriculum

SWOT Analysis
1. Strength points
   • Generally, the courses hours are adequate for department, college and university requirements.
   • The syllabus is specified by an authorized committee at the ministry of higher education.
   • The evaluation and change of syllabus is suggested by the lecturer for each subject.
   • The staff members have a cooperative spirit.
SWOT Analysis

2. Weakness points

- The syllabus change procedure is depending on the ministry approval due to the restricted laws.
- The coding of the courses sequence is different between colleges for university requirements and between departments for college requirements like the code number of Human Rights and engineering drawing.
- The system of study is the annual system.
- Absence of Basic science courses such as Physics, Management, and Psychology.
- Absence of Statistical Engineering courses.
- Absence of community service course.
Curriculum

SWOT Analysis
2. Weakness points

- English Language ME 1309 is classified as a department requirement.
- Weakness the experimental sides due to the poor situation of laboratories.
- Absence the financial support to graduation project.
- Absence the incentives which reduce the competition between the student.
- Weak support to the entertainment like sport and arts.
- Limited support of training abroad.
SWOT Analysis

2. Weakness points

- Absence the supporting to scientific services like copying document, buying the materials of researches.
- Absence the supporting to participation on scientific journals.
- Busyness most of the student to provide the life requirements.
- The limited communication with the international universities and research centers.
SWOT Analysis

3. Opportunities points

- The ministry allows syllabus’s change with a ratio of 20%.
- Other ministries provide a support to the graduation project such as the ministry of youth and sport.
- Acceptance the scientific researches in international and local conferences.
- The students are training at industrial foundation during summer holiday.
- The graduation project may be supported by different ministries.
SWOT Analysis

4. Threats points

• Graduated the engineers have an inadequate in experimental background.
• The staffs members are suffer from stress due to the heavy weekly load in specified period through the day.
• Decrease the educational levels of student.
TOWS Strategy

1. SO:
   - Establish a Curriculum evaluation committee in each department and submit an annual report to evaluate the syllabuses, hours, type of subject depending on the notes lecturer of each subject.
   - Increase the financial supporting for staff to take training abroad.
   - Contact the industrial foundation to solve their engineering problem through the graduation project.
TOWS Strategy

2. ST:
   - Decrease the weekly load of the faculty by increase the employment.
   - Increase the social relation between staff and students by communion in entertainment like sport, arts, and social clubs.
   - Increase the financial supporting for staff with their students for training or making researches abroad.
TOWS Strategy
3. WO:

- The report of Curriculum evaluation committee (as suggested in SO) must have the approval of university committee only.
- For unified the codes, the chair of Curriculum evaluation committee in each department must be a member in Curriculum evaluation committee of the college. Also the chair of Curriculum evaluation committee of the college must be a member in Curriculum evaluation committee of the university.
TOWS Strategy

3. WO:

- Proceeding study to adding the following courses: Physics, chemistry, Statistical Engineering and community service.
- Proceeding study to review the coding and the type of some courses like English Language
- Proceeding study about the system of study (annual or quarterly)
- Increase the financial supporting for the scientific researches acceptance in international and local conferences.
TOWS Strategy
4. WT:

- Increase the financial support to the graduation project.
- Increase the hours the graduation project.
- Increase the staff employment besides providing the safety to reduce the stress.
- Provide a student by a monthly bestowal to withstand the life requirements.
- Increase the support to the laboratories, training, graduation project, libraries, and communication service.
- Increase the support to the housing of students.
Support Services
Budget allocation mechanism
The Ministry of Finance in the Republic of Iraq is allocate the annual budget of all Ministries, including the Ministry of Higher Education and scientific research, the later is allocate the planed part of the ministry budget to the university of Wasit, which in turn it distributes the budget to the colleges including the College of Engineering at a rate ranging between 50 to 60% of the value of the suggested budget that are prepared by the Accounts Division at the college before the end of the year. There is no budget allocated for each department individually.
## Staff expenses

This includes Salaries, basic fees, and allowances as shown in chart below.

<table>
<thead>
<tr>
<th>Year</th>
<th>Salaries</th>
<th>Allowance</th>
</tr>
</thead>
<tbody>
<tr>
<td>2008</td>
<td>417078513</td>
<td>668053768</td>
</tr>
<tr>
<td>2009</td>
<td>434441683</td>
<td>728389704</td>
</tr>
<tr>
<td>2010</td>
<td>585446564</td>
<td>894597922</td>
</tr>
</tbody>
</table>

**Legend:**
- Blue: salaries
- Red: Allowance
Support Services

Goods and services
This includes Goods items, and Services items as shown in chart below
Support Services

Maintenance

- 2008: 2,066,525
- 2009: 2,036,750
- 2010: 20,981,200
Capital expenditures
This includes Transportations, and Tools and machines as shown in chart below
Support Services

Other expenses
Such as, Rewards for non-members staff, students allowance, and other expenses as shown in chart below
Support Services

SWOT Analysis

1. Strength points
   - Large allocated of annual budget.
   - Large budget for maintenance.
   - Large amount of budget reserved for tool expenses

2. Weakness points
   - Absence of allocation for scientific research.

3. Opportunities points
   - The ministry supports the scientific research funding

4. Threats points
   - Lack of scientific research due to funding limitation to this area.
Thanks