



Annual Program Report

— (Bachelor)

Program: Bachelor of science in Mechanical engineering
Program Code (as per Saudi Standard Classification of Educational Levels and Specializations): Mechanical Engineering (071501)
Qualification Level: 6
Department: Mechanical engineering
College: Faculty of Engineering
Institution: University of Tabuk
Academic Year: 2022-2023 (1444-1445)
Main Location: Campus
Branches offering the Program (if any): <ul style="list-style-type: none">•••

Table of Contents

A. Program Statistics	3
B. Program Assessment	3
1. Program Learning Outcomes Assessment and analysis according to PLOs assessment plan *	3
2. Evaluation of Courses	4
3. Students Evaluation of Program Quality	4
4. Scientific research and innovation during the reporting year	4
5. Community Partnership	5
6. Other Evaluation (if any)	5
C. Program Key Performance Indicators (KPIs)	6
D. Challenges and difficulties encountered by the program (if any)	6
E. Program development Plan	7
F. Approval of Annual Program Report	7



A. Program Statistics

Item	Number
Number of students enrolled in the program	187
Number of students who started the program (in reporting year)	43
Number of students who completed the program	64

B. Program Assessment

1. Program Learning Outcomes Assessment and analysis according to PLOs assessment plan *

#	Program Learning Outcomes	Assessment Methods (Direct and Indirect)	Targeted Performance (%)	Assessment Results
Knowledge and Understanding				
K1	An ability to demonstrate knowledge of concepts of mechanical engineering and science	midterm exams, final exams, and quizzes Exit survey conducted with graduating students	60 %	77.33%
Skills				
S1	An ability to identify, formulate, and solve complex engineering problems by applying principles of mechanical engineering, science, and mathematics.	midterm exams, final exams, quizzes and homework Exit survey conducted with graduating students	60 %	74.66%
S2	An ability to apply engineering design to produce solutions that meet specified needs with consideration of public health, safety, and welfare, as well as global, cultural, social, environmental, and economic factors.	midterm exams, final exams, quizzes and homework Exit survey conducted with graduating students	60 %	71%
S3	An ability to develop and conduct appropriate experimentation, analyze and interpret data, and use engineering judgement to draw conclusions.	Report and Lab exam Exit survey conducted with graduating students	60 %	91.66%



S4	An ability to communicate effectively with a range of audiences.	SDP Report & Presentation Exit survey conducted with graduating students	60 %	86.5%
Values, autonomy, and responsibility				
V1	An ability to recognize ethical and professional responsibilities in engineering situations and make informed judgements, which must consider the impact of engineering solutions in global, economic, environmental, and societal contexts.	SDP semester work Exit survey conducted with graduating students	60 %	94.5%
V2	An ability to function effectively on a team, whose members together provide leadership, create a collaborative and inclusive environment, establish goals, plan tasks, and meet objectives.	SDP semester work Exit survey conducted with graduating students	60 %	95%
V3	An ability to acquire and apply new knowledge as needed, using appropriate learning strategies.	SDP semester work Exit survey conducted with graduating students	60 %	88%

*Attach a separate report on the program learning outcomes assessment results for male and female sections and for each branch (if any).

Strengths:

The detailed analysis reveals that the ME program has strengths in areas such as ethical responsibility, conducting experiments, and lifelong learning. However, there are fluctuations in performance, particularly in engineering design (PLO(S2)) and teamwork (PLO(V2)). These fluctuations may be indicative of challenges faced during specific trimesters, and the program may benefit from targeted interventions or curriculum adjustments to address these issues.





Aspects that need improvement with priorities:

The program should consider fostering more consistent outcomes in PLO(S2) and PLO(V2) to ensure that students develop strong engineering design and teamwork skills throughout their academic journey. This can contribute to more well-rounded and capable graduates in the field of mechanical engineering.

1. Include solving more problems in lectures.
2. Improving students' English language, writing, and communication skills. This is essential for effective learning and professional development.
3. Encouraging students to develop self-confidence, motivation, and independent work skills is a recurring theme.
4. Assigning group projects or peer-to-peer activities

2. Students Evaluation of Courses

Course Code	Course Title	Number of Students Who Evaluated the Course	Percentage of Participants	Evaluation Results	Developmental Recommendations
ENG0201	Engineering Drawing	13	41%	9.42	for missed view derivation, instructor can start with students with more simple models, from beginning of the semester
ENG0203	Engineering Mechanics 1	3	8.6%	9.5	Ask students to give constructive feedback on each other's work and to explain difficult ideas to each other
ENG0202	Engineering workshops	8	45	9.08	Provides more experiments on workshops session.
ENG0204	Engineering Mechanics 2	63	64.3%	9.6	Underscore the importance of regular work, steady application, self-pacing, scheduling.



Course Code	Course Title	Number of Students Who Evaluated the Course	Percentage of Participants	Evaluation Results	Developmental Recommendations
ME0211	Mechanical Drawing and Graphics	13	31.7%	8.6	focusing more on AutoCAD drawing
ME0202	Manufacturing processes	15	37.5%	9.44	Making videos and preparing prefabricated shapes
ME0212	Mechanics of Machines	4	23.5%	9.5	Improve PPT slides for minor mistakes & add more solved examples.
ME0213	Mechanics of Materials	25	25%	9.94	Add more exercises solved tutorials
ME0231	Fluid Mechanics 1	33	68.8%	8.8	Course coordinator should present Course Schedule, objectives, and evaluation strategies to students.
ME0314	Mechanical vibrations	18	82%	8.36	Course coordinator should update the textbook version.
ME0315	Mechanical Design (1)	5	15.2%	9.6	Improve PPT slides for minor mistakes & add more solved examples.
ME0323	Thermodynamics -2	42	98	8	Course coordinator should update the teaching content and should be delivered properly to the students.
ME0317	Mechanical Design (2)	17	37%	9	Improve PPT slides for minor mistakes & add more solved examples.
ME0322	Heat transfer	36	69.2 %	8.4	using moderate number of slides and involve them more with real applications



Course Code	Course Title	Number of Students Who Evaluated the Course	Percentage of Participants	Evaluation Results	Developmental Recommendations
ME0332	Turbomachinery (1)	22	41.5%	9.31	Solved more problem-based design in the class
ME0342	Computer Aided Design	6	20%	8	Improve PPT slides for minor mistakes & add more solved examples.
ME0424	Refrigeration and Air Conditioning	15	57.6%	9.56	Solved more problem-based design in the class
ME 0434	Basic Hydraulic and Pneumatic Systems	11	50%	10	Setup experiments
ME0444	Mechatronics 1	5	22%	10	Setup experiments
ME 0493	Graduation Project I	2	33%	9	Advise in management teamwork's
ME0425	Power and Desalination Plant	37	95%	9.8	Update material sources
ME0494	Graduation Project (2)	3	60%	9.9	Giving more time for the graduation project
ME0461	Materials Selection in Design	2	40%	10	Improve PPT slides for minor mistakes & add more solved examples.
ME0455	Fluid Mechanics (2)	19	65.5%	7.6	Giving more time to the main topics
ME0459	Design of Thermo-Fluid Systems	12	66.5%	9.8	Update material sources
ME0445	Computer programming and Applications	15	57.6	9.2	continue encourage students to get their accounts in MATLAB online





Course Code	Course Title	Number of Students Who Evaluated the Course	Percentage of Participants	Evaluation Results	Developmental Recommendations
ME0466	Finite element methods and application on design	21	81	8.6	Purchase code based finite -element methods (Abaqus ,Ls-Dyna)
ME 0491	Selected topics in Mech Eng II	7	27%	9.9	Improve PPT slides and add more solved problems.

Course Code	Course Title	Number of Students Who Evaluated the Course	Percentage of Participants	Evaluation Results (out of 10)	Developmental Recommendations
-------------	--------------	---	----------------------------	--------------------------------	-------------------------------

3. Students Evaluation of Program Quality

Evaluation Date: 28/03/2023	Number of Participants: 38
Students Feedback	Program Response
<p>Satisfaction with the offered services in the program Target: 4 Average score: 3.7 External target: 4.4</p> <p>Strengths:</p> <ul style="list-style-type: none"> - Adequate facilities are available at the university for performing religious rites. - Academic advisor allows the students enough time for guidance & advice. 	<ul style="list-style-type: none"> ● Maintain the quality of the offered services
Areas of Improvement:	





<ul style="list-style-type: none"> - The program may revisit the external benchmarks for its improvements to meet national and international standards. <p>Priorities for Improvement</p> <ul style="list-style-type: none"> - The program may revisit the external benchmarks for its improvements to meet national and international standards. 	
<ul style="list-style-type: none"> - Quality of learning experience in the Program - Target : 4 - Average score : 4.15 - External target : 4 - Strengths: - The infrastructure that includes the lab, and research facility provided by the program ensures safety and security with sufficient lighting and ventilation are provided in the classrooms along with Multimedia (projector) learning facilities. - Appropriate safety and firefighting measures are in place in the academic and laboratory buildings. - In the Learning Experience and Resources, knowledge, skills, and values, the student learns, are appropriate for his/her future career. It also educates students on how to effectively work individually and in a team. - The Registration and Communication program is easy and efficient (including website and IT services). It also includes the orientation program, which helps fresh students at the start of their academics. - At the registration, Students easily find information about the university and its programs before course registration. - The program provides the code of conduct, rights and duties, academic policies, and grievance redressal mechanisms. - The part of Guidance and Support, Institute gives ample opportunities to improve employment skills. - The staff members are fair and supportive in their treatment of students. - The program offers ample opportunities for club activities to help students in their development with necessary pieces of training and industrial visits provided by the program to enrich their skills. - The program motivates the student to higher education and lifelong learning. - The program's Feedback and Grievance Redressal system supports Students to share their feedback on any academic activities with higher authorities. The faculty and administration are responsive to resolving the grievances of the students. - Faculty, advisors, support staff, and administration are easy to approach and available for interaction. 	<ul style="list-style-type: none"> ● Maintain the quality of learning experience.





<p>Areas of Improvement:</p> <ul style="list-style-type: none"> - The number of respondents in this survey is very less. <p>Suggestions for improvement:</p> <ul style="list-style-type: none"> - Encourage student to response to the survey. 	
<p>Satisfaction of Beneficiaries with the learning resources</p> <p>Target : 4</p> <p>Average score : 3.38</p> <p>External target : 3.35</p> <p>Strengths:</p> <ul style="list-style-type: none"> - The Study environment (comfort, lighting, quietness) is appropriate. 	<ul style="list-style-type: none"> ● Maintain the quality of leaning resources.
<p>Areas of Improvement:</p> <p>.</p>	
<p>Suggestions for improvement:</p> <p>.</p> <ul style="list-style-type: none"> - 	

4. Scientific research and innovation during the reporting year

Activities Implemented	Number
Published scientific research	10
Current research projects	1
conferences organized by the program	0
Seminars held by the program	0
Conferences attendees	0
Seminars attendees	0



Discussion and analysis of scientific research and innovation activities:

-

The scientific research and innovation activities need improvement. Required actions should be implemented as:

- ✓ Motivation for publications: A minimum of 2 ISI publications per academic year are mandatory for individual faculty for his continual academic service besides honorarium through funded and non-funded projects.
- ✓ Funding Research: Faculty members should be able to receive research grants provided by university/ national/ international agencies.
- ✓ Implementation of minimum 2 publications per faculty for contract renewal has helped increase number of publications within the department. Faculty members should be able to make national and international collaborations to enhance research and innovations.

5. Community Partnership

Activities Implemented	Brief Description*
Seminar for exit students presented by a representative of the BAE system company	Description of the BAE system company and employment opportunities therein
Career Guidance Sessions	Offer career guidance sessions to high school students, providing insights into the diverse career paths within EE/ME/CE/IE engineering. Discuss the educational requirements, potential specializations, and the real-world impact of the field.
Engineering Orientation	Orientation to help high school students in the surrounding community understanding engineering program.
STEM Workshops and Demonstrations	Conduct interactive STEM workshops to introduce basic principles. Involves faculty members guiding students in workshop design and delivery.

* Including timing of implementation, number of participants, and outcomes.

Comment on community partnership activities**

The community partnership activities need improvement. Required actions should be implemented as:

- ✓ Establishing Collaborations with other Institutes, Community, Industries, and industrial advisory board within the department will enhance the consultancy project ensuring community partnership.

** including overall evaluation of the program's performance in these activities (if any).



6. Other Evaluation (if any)

(e.g., independent reviewer, program advisory committee, and stakeholders (e.g., faculty members, alumni, and employers))

The ME program was evaluated by the ABET reviewers in November 2022. The ME program Accredited to September 30, 2029.

* Attach independent reviewer's report and stakeholders' survey reports (if any).

Evaluation method: direct	Date: 28/03/2023	Number of Participants: 46
Summary of Evaluator Review		Program Response
Target: 4 Average score :3.7 External target: 4 Strengths: <ul style="list-style-type: none"> - The Mechanical Engineering program vision reflects a dynamic, distinguished, and competitive higher education system. - The program mission aligned with Saudi Vision 2023 . - The program has a mission statement that is simple, clear, and appropriate. The program's mission and its goals are consistent with the mission of the institution/college. - The objectives are consistent and supportive of its mission. - The program mission and goals (objectives) are appropriately articulated and reflected in the curriculum and learning outcomes. 		<ul style="list-style-type: none"> • Maintain the program mission and goals
Points for Improvements: <ul style="list-style-type: none"> - . 		<ul style="list-style-type: none"> • .
Suggestions for development: <ul style="list-style-type: none"> - 		



C. Program Key Performance Indicators (KPIs)

Including the key performance indicators required by the NCAAA.

No	KPI	Targeted Value	Actual Value	Internal Benchmark	Analysis	New Target
1	Percentage of achieved indicators of the program operational plan objectives	50%	65%	NA	The actual benchmark achieved the target, by the time of the analysis of this KPI, the internal KPI was not available. The KPI is taken as achieved and considered as the program's strength.	65%
2	Students' Evaluation of quality of learning experience in the program	4	4.14	3.92	The actual benchmark achieved the target and exceeded the internal benchmark. The KPI is taken as achieved.	4.25
3	Students' evaluation of the quality of the courses	4	4.25	3.94	The actual benchmark meets the target and the internal benchmarks. The KPI is taken as achieved.	4
4	Completion rate	60 %	44.82%	30 %	The actual benchmark is short of the target, exceeding the internal benchmark. The reason for this is poor results in some courses. More emphasis on math and mechanical design courses needs to be made.	60 %
5	First-year students retention rate	100 %	100%	100 %	The actual benchmark is 100% and the target has been achieved. The actual benchmark is equal to the internal benchmarks. The KPI is taken as achieved.	100 %
6	Students' performance in the professional and/or national examinations	70%	100% Avg. Score 29.78	55% Avg. Score 34.57	Till the previous this KPI couldn't be measured due to the unavailability of data and most students not appearing in the FE	100% of student s appear and



					exam. The qualifying score is 62% for the FE exam. The target for this KPI in 2022-23 is that 100% of the students should appear in the FE exam and 70% of them should qualify it. The actual benchmark met the target and exceeded the external and internal benchmarks, hence the KPI is taken as achieved for 2022-23. However, the average score of the students (29.78) is far less than the qualifying score (62%).	50% of students qualify the FE exam.
7	Graduates' employability and enrolment in postgraduate programs	50 %	22.2% (a) 18.5 3.7	80 %	The employability ratio is short of the target and the internal benchmarks. The data of some graduates could not be collected due to the poor response of the graduates to the communication requests from the program. The KPI is not achieved, and the actual benchmark is short of the target and the benchmarks, hence it is identified as the weakness of the program.	50 %
8	Average number of students in the class	40	33	25	The number of students in the class achieved the target but was still higher than the internal benchmarks. The program needs to expand its infrastructure capacity	25





					to achieve the target and benchmarks.	
9	Employers' evaluation of the program graduate's proficiency	4	4.09	3.56	The employer evaluation of the graduates meets the target and the internal benchmark. This KPI is taken as achieved.	4.25
10	Students' satisfaction with the offered services	3.5	3.77	3.24	The students' satisfaction with the offered services meets the target and the internal benchmark. The KPI is taken as achieved.	3.75
11	Ratio of students to teaching staff	20:1	21:1	20:1	The ratio of the students to teaching staff is slightly higher than the target and the internal benchmarks. The KPI is not achieved.	20:1
12	Percentage of teaching staff distribution	80%	100%	90 %	The actual benchmark meets the target. So, the KPI is taken as achieved and KPI 12 is considered as the program's strength.	80%
13	Proportion of teaching staff leaving the program	0%	0%	0 %	No faculty left the ME department for reasons other than retirement. The KPI is taken as achieved and it is the strength of the program.	0%
14	Percentage of publications of faculty members	30 %	45.45%	44 %	The publications of faculty achieved the target and the internal benchmark. The KPI is taken as achieved, however, further improvement is desirable next year.	50 %
15	Rate of published research per faculty member	2	0.9	1.88	The actual benchmark is well short of the target and the internal benchmarks. The KPI	2





					is not achieved and needs improvement.	
16	Citations rate in refereed journals per faculty member	1	0.56	41	The citation rate per faculty member is low, short of the target and much less than the benchmarks. The KPI 16 is a weakness of the program.	1
17	Satisfaction of beneficiaries with the learning resources	3.5	3.45	4.27	The actual benchmark meets the target but is less than the internal benchmark. The KPI is taken as achieved.	3.5

Comments on the Program KPIs and Benchmarks results:

All 17 KPIs were evaluated to understand the progress of the program. Since most of the KPIs are satisfied, the program is progressing. However, there are some concerns over the evaluation of KPIs based on Students' performance in the professional and/or national examinations, unless the registration is made through the department.

D. Challenges and difficulties encountered by the program (if any)

Teaching	Reducing class sizes
Assessment	none
Guidance and counseling	High students' number assigned to the academic advisor
Learning Resources	Maintenance of the equipment: Requested high authorities and looking for a maintenance policy
faculty	Faculty should be encouraged for promotion
Research Activities	Research space should be allocated for the faculty
Others	



E. Program development Plan

No.	Priorities for Improvement	Actions	Action Responsibility
1	Problem Solving and Practice: Several instructors emphasize the importance of problem-solving skills by proposing actions that include solving more problems in lectures, providing detailed lecture notes, and giving additional homework assignments. This approach encourages students to practice and apply their knowledge.	emphasize the importance of problem-solving skills by proposing actions that include solving more problems in lectures, providing detailed lecture notes, and giving additional homework assignments	Instructors
2	The program should develop a process to encourage students for preparation of the FE exam and help them academically and by motivation to pass the FE exam. The target for this KPI should be revised and based on the percentage of students appearing and well as qualifying the FE exam.	Develop a process to encourage students for preparation of the FE exam and help them academically and by motivation to pass the FE exam. The target for this KPI should be revised and based on the percentage of students appearing and well as qualifying the FE exam.	Department Council
3	The graduates' employability needs improvement.	offer employability-based training programs to the graduates and conduct an orientation program to explain the need of the connectivity and support the program can offer to the graduates once they pass the program.	Alumni Affairs and Labor Market Needs Committee
4	The program should take the necessary steps to improve the teaching student to staff ratio by recruiting more faculty.	Improve the teaching student to staff ratio by recruiting more faculty.	Department Council
5	The publication per faculty needs improvement	Improve the publication per faculty	Program Chair
6	The program needs significant improvement in the research contribution of the faculty members.	Improve significantly the research contribution of the faculty members	Graduate Studies and Research Committee
7	The faculty should be encouraged to identify innovative ideas and prepare and file patent applications.	Encourage the faculty to identify innovative ideas	Graduate Studies and Research Committee



and prepare and file patent applications.

- Attach any unachieved improvement plans from previous report.
- The annual program report needs to be discussed in department council.

F. Approval of Annual Program Report

COUNCIL / COMMITTEE	ME Council
REFERENCE NO.	ME council No. 21, 1445/01/12
DATE:	12/01/1445

