



Faculty of Engineering
Cairo University



Cairo University Mechanical Design Engineering (MDE) Tuning Africa contribution

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Abstract

As the call for developing competitive harmonized African higher education rises, it is necessary to know current educational situation in the member Universities. The best way to rate and judge an educational system is by considering the feedback of the two main elements in it: the teaching staff and the students. The tuning African Academy initiated the step of collecting information from students in the 123 contributing universities.

This report focuses to answer all the obligatory, optional as well as other related questions in the field of **Mechanical Design Engineering in Cairo University** credit hours system. The answers are collected from the students of MDE program and are discussed in this briefly focused report.

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Introduction

Tuning Africa aims to provide a powerful higher educational system having the ability to produce professional graduates that can compete in the world market. Among the contributing universities this report focuses on Cairo University particularly Faculty of Engineering Mechanical Design Engineering (MDE) program, credit hours system.

The Tuning staff participant: Prof. Chahinaz A. R. Saleh Abdel-Ghany provided a survey for specific educational subjects at the end of spring 2016 semester. Now, it is the time for detailed accurate answers for the given questions in the contribution information file.

For reliable answers and feedback, questions were presented to a group of students of the same major. All questions were discussed and the results are shown below in brief categorized topics. A survey was made using SurveyMonkey® that was given to students to answer. The survey covers all questions mentioned in the contribution information file. Eight students fully completed the survey with all of its details. Students that did not complete the survey were invited in an open discussion session to include their opinions. Last but not least, a poll was made using Facebook for MDE students that ask them how are they satisfied with the program.

First, questions related to workload are discussed which are marked as obligatory in the contribution requirements. Second, future related questions are discussed which are marked optional. Finally, a brief conclusion for the whole educational system of the MDE program in which all answers are summarized.

FIRST: WORKLOAD EVALUATION

This type of information were marked obligatory due to their importance in determining the quality of information received by students. Questions were categorized and discussed below.

Different kinds of activities students do for university work

Activities include:

- Lectures, which take a lot of time as it is usually three hours a week plus two hours tutorials which are taken as lectures frequently due to long syllabus.
- Seminars, they are taken starting from the junior level that are very useful as they are always related to practical industry.
- Essays, assignments and projects that take the longest time in a week. Assignments vary from individual assignments to group assignments. Projects are usually –with a percentage of about 90%– group work.
- Internet research and self-learning, consumes a lot of time to fully understand projects and assignments.
- Laboratories and practical work: the least time of all activities as many subjects do not care about practical work; which in turn decrease student's indulgence in the subject.

In a nutshell, lectures and tutorials consume the majority of time during college day while assignments and projects take almost all remaining time.

Time consumed for each activity in a typical week

Time for each activity is estimated in a typical week according to the voting of the students of the MDE program and is shown in figure1. Figure 2 shows the same data expressed in percentage instead of number of hours per week.

Time spent in social relationships as well as that spent in vital activities (as eating and sleeping) is eliminated from the evaluation as it differs from one to other and is not related to this topic.

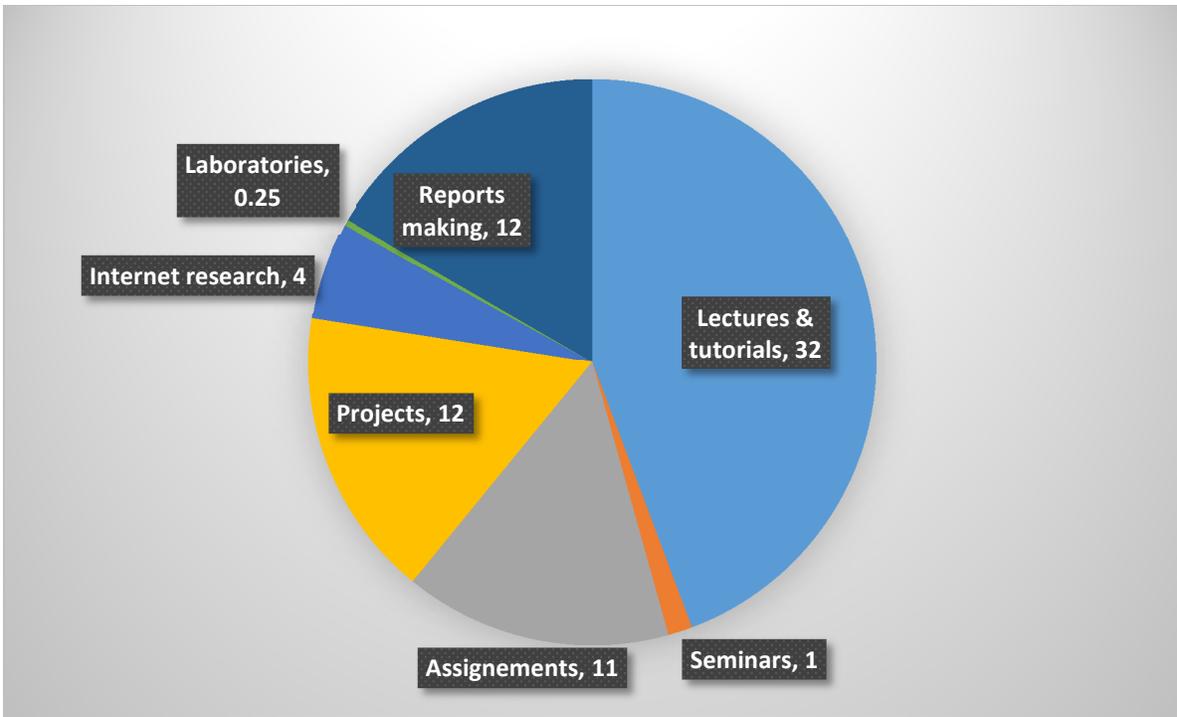


Figure 1 Time consumed for different activities in a typical week in hrs/week

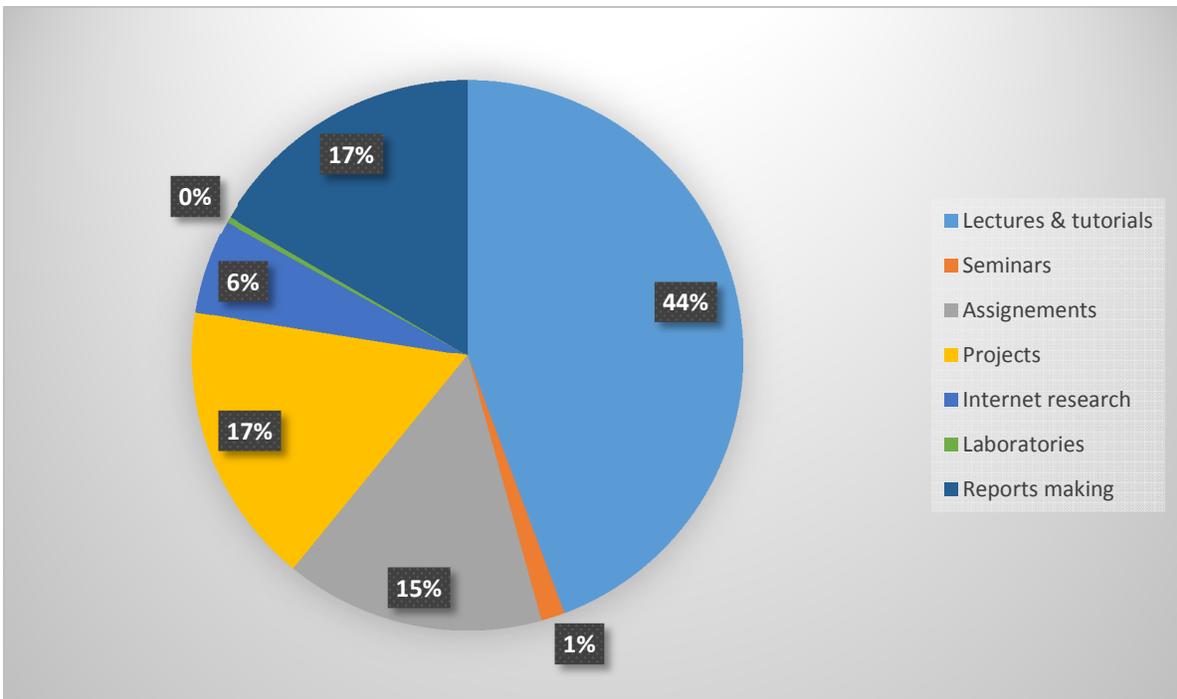


Figure 2 Time consumed for different activities in a typical week in percentage

Relation between exams week and typical week activities

In midterms week(s), the previous time distribution does not differ much as midterms week in the credit hours system is considered a typical week in which all lectures are taken normally and deadlines not affected.

In finals week(s), almost all university work –as assignments, reports and projects– is finished and most time is spent in studying and internet research.

Due to the huge amount of work –as studying, report and projects submissions– during the midterm week(s); students be under huge pressure and consume many time after that week as recovery to be able to continue the semester.

Finals week(s) is not accompanied with a preceding study week and lectures continue to the end of the preceding week. This leads to a lot of study work to do in the final week(s).

The most effective activity for achieving learning outcomes for a given course

Practical work, sites visits and projects is considered the best way for achieving ILOs for a course as agreed by all students.

The credit hours system gives project a high priority and a high percentage in course work. A positive thing to mention as these projects decrease the gap between student and the subject.

Activities students like to have more time for

Suggested activities by students for both exams and typical weeks are discussed below in a simplified format as shown.

IN A TYPICAL WEEK

As the lab work is very little and almost not found in a typical week; the demand to have more time for it is rational.

IN EXAMS WEEK

In-class problems solving and examples related to the subject and real life problems. In other words the need of simplified and summarized tutorials and lectures that relate different topics in the subject with each other.

Sites visits should be given more time and the university should contract with workshops and factories to enable students to visit them.

Activities that take the most time

As discussed in figure 1 and 2 lectures, assignments and report making take the most time in a typical week. On the other hand, Studying and internet research take the most time during exams week.

Other commitments in a typical week apart from university

Most of MDE students go to the gym regularly for an average of 10 hours per week. Other sports like football take about 4 hours per week. Family and friends meeting and social life takes an average of 15 hours in a typical week. Family and friends gatherings is dependent on social occasions and events and sometimes take more or less time than that mentioned above.

Some other students have part time online jobs that they do in weekends and holidays. Also hobbies like novel reading, mini crafts and learning new engineering softwares takes about 6 hours in a typical week.

Foreign language courses –as Spanish, German and Japanese– take about 6 hours per week. These courses are only taken by some MDE students not all of them.

SECOND: FUTURE RELATED INFORMATION

This type of information was marked as obligatory in contribution information document. Answers may extremely differ from one student to the other, thus each students' answer will not be discussed solely, but an overall review that is not far from the answers of students is discussed below.

The most preferable job

A junior mechanical designer is a satisfying fresh graduate job. This helps in developing experience and the ability to apply engineering knowledge gained in practical fields.

In ten years time, A dream job as formula one mechanical designer –or an aerodynamic designer– in one of the top formula one teams as Redbull or Ferrari.

Needed skills for the jobs

The type of mechanical design jobs is very critical and requires good knowledge and precision. Mastering CAD softwares and finite element programs is essential in any mechanical related job especially in a fresh graduate job.

Experience, problem solving, time management and leadership skills is the most important skills that should be mastered by the end of the ten years time. This will give the opportunity to work as a senior designer in one of the most critical areas as formula one.

Skills and competences that need to be developed

As mentioned above CAD and FEA softwares are very important, therefore mastering these softwares before graduating is essential. In addition, leadership, communication and presentation skills should also be mastered before leaving university. Fortunately, university especially the credit hours program focuses to strengthen these skills in students before graduation.

Ways to demonstrate these skills and abilities to potential employers

Certificates can provide an official way to prove the level of a gained skill as computer softwares. Skills as communication and presentation skills is best demonstrated by performing presentations and in interviews. In addition, previous performance in internships done before in the same company provides a feedback to the employer especially in the field of commitment and hard work.

Previously made projects provides a very good demonstration for the employer. These projects could be that done in university –as graduation project– or other private projects or from a previous job.

Answers of some students regarding their expecting job

By chance, one other student was also interested in being a formula one designer. Other answers included being a junior designer in a local company followed by being a manager in a multinational company. A job as a teacher assistant as a fresh graduate followed by being a professor in ten years period.

All other students' answers related to skills and abilities demonstration was quite similar to that discussed above.

Third: Rating for the MDE program

Students were asked 'How would you rate MDE program' using a Facebook poll. Choice were: Excellent, Very good, Good, Poor and the answers are shown below.

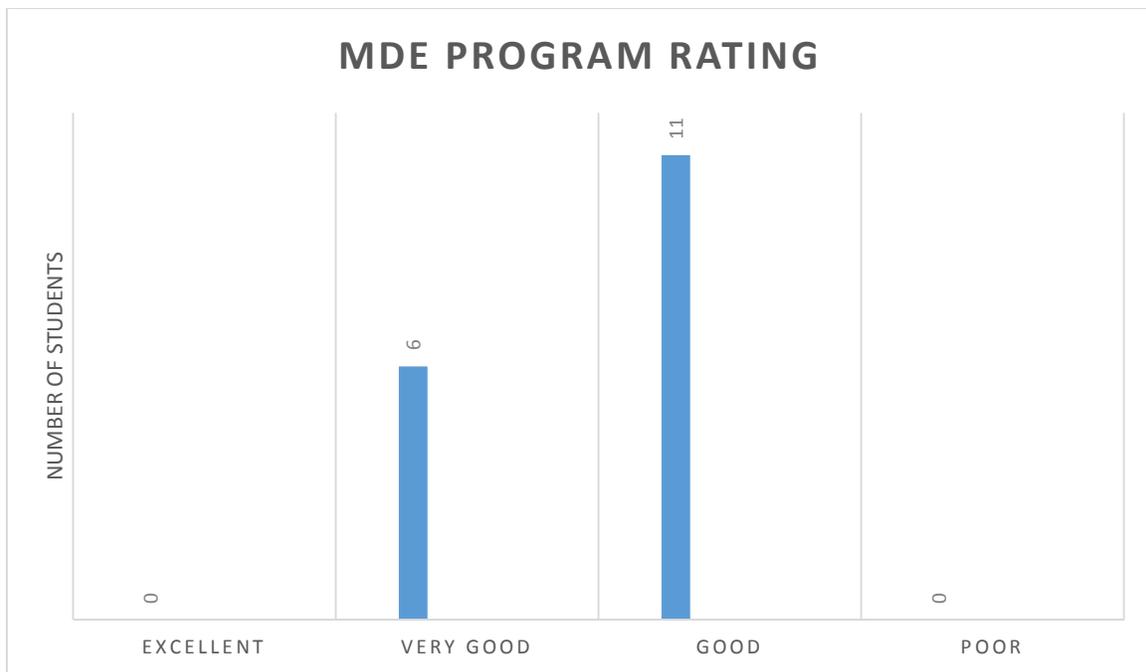


Figure 3 Data of MDE program rating poll

Conclusion

The MDE program in the credit hours program is concerned to acquire its students the best quality of soft skills. Lectures and tutorials takes most of the day thus students find it difficult to keep up with deadlines and projects. Laboratories, practical work and sites visits do not take the needed attention from the university. Overall, the MDE program focuses on hard work to let students gain the ability of working under huge pressure and submission of reliable work before deadlines. The credit hours program is a good approach to an updated educational system in Egypt. The road still at its beginning and the need of developing and improving keeps rising.