MECHANICAL ENGINEERING

UNDERGRADUATE ADVISING MANUAL

UNIVERSITY of ARKANSAS

1871

For Students Entering Fall 2012

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DISCLAIMER

This document is intended to assist students in planning their academic program. It is not an official publication. The only official documents describing a student's degree requirements are those of any one catalog in effect while that student is enrolled. Degree requirements of a catalog must be satisfied by present course offerings.

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1. INTRODUCTION

The intent of this manual is to help students become familiar with the mechanical engineering curriculum and other aspects of the mechanical engineering department such as advising procedures and student societies. This manual should be used as a reference for students making out a four year plan. However, this manual is not an official university publication and should not supersede the university catalog. It is the student's responsibility to be knowledgeable of the contents of the university catalog and to ensure that its requirements are fulfilled.

2. CURRICULUM

The mechanical engineering curriculum consists of 124 hours. Included in these 124 hours are 8 hours of science electives, 12 hours of technical science electives, 18 hours of humanistic social science electives, and 4 hours of creative project. Each of these categories of courses is discussed in detail in Sections 2.2 through 2.6. In addition, a flow chart of the curriculum is shown and discussed in Section 2.1.

2.1 Curriculum Flow Chart The mechanical engineering curriculum flow chart is shown in Figure 1. In this figure the entire curriculum is laid out on a four year plan. Students who are on schedule their freshman year will take the first column of courses their first semester and the second column of courses their second semester. As a sophomore, students will take the courses listed in columns 3 and 4, junior students will take the courses listed in columns 5 and 6, and senior students will take the courses listed in columns 7 and 8. Typically students do not follow the flow chart as it is listed in Figure 1. These students are out of sequence and may choose to attend summer school to get back in sequence.

Required courses are identified as circles in the flow chart, the humanistic social science electives are identified with triangles, and the science and technical science electives are identified with squares. The solid lines in the flow chart represent prerequisites and the dashed lines represent pre/co-requisites. For example, CHEM 1113, MATH 2554, and PHYS 2054 are all prerequisites for MEEG 2303. Some of the courses are only offered once during the academic year (fall and spring). These courses are identified with a “$” under the course name. Identifying courses offered once a year will be particularly important to students who are approaching their junior year. These students will need to plan ahead to ensure that they do not get out of sequence.

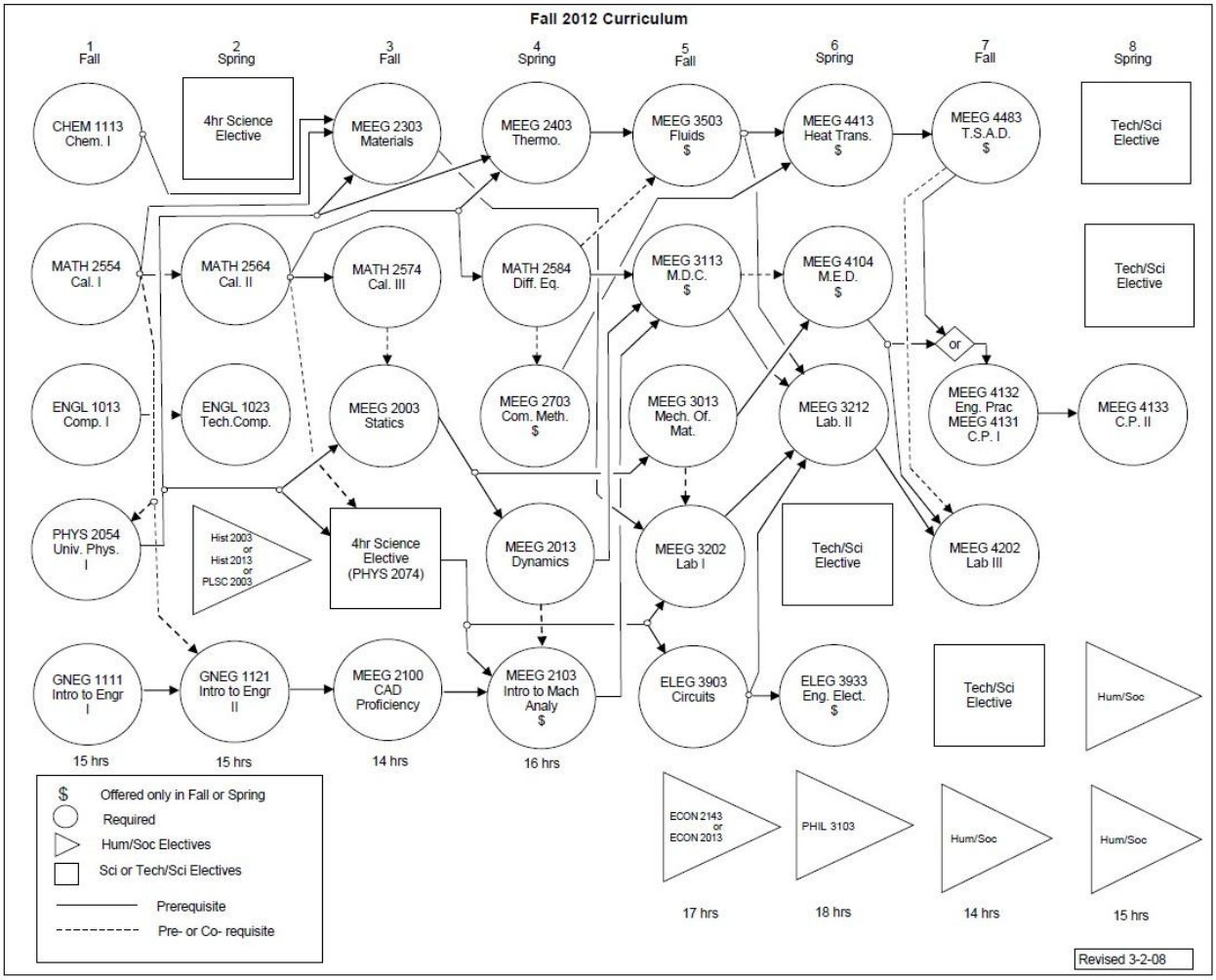

Figure 1 Curriculum Flow Chart

2.2 Science Electives Students are required to take two 4 hour science elective courses. The 4 hours entails a 3 hour lecture and a 1 hour lab. One of these courses must be PHYS 2074 University Physics II. It is recommended that students take the first 4 hour science elective in their second semester of their freshman year and the other (PHYS 2074) in the first semester of their sophomore year. Acceptable science electives are listed below:

ASTR 2003 & 2001L – Survey of the Universe
BIOL 1543 & 1541L – Principles of Biology
BIOL 2213 & 2211L – Human Physiology
CHEM 1133 & 1131L – University Chemistry for Engineers II
GEOL 1113 & 1111L – General Geology
PHYS 2094 – University Physics III
PHYS 3544 – Optics
PHYS 3603 & 3601L – Introduction to Modern Physics

2.3 Technical Science Electives As part of the mechanical engineering curriculum, students are required to complete 12 hours of technical science electives. These electives can be categorized into three groups: (1) Mechanical Engineering Electives, (2) Engineering Electives, and (3) Science Electives. Each group is described in more detail below.

Mechanical Engineering Electives. The acceptable Mechanical Engineering Electives are all mechanical engineering courses numbered at or above the 4000 level not already required in the mechanical engineering curriculum. Special Project courses (MEEG 491V) are normally not allowed as electives. However, Special Project courses may be allowed under very special conditions but must be approved **in advance** by the mechanical engineering curriculum committee. Students may also use a maximum of three hours of research for a technical science elective if it is completed under a special project course number (MEEG 491V) and if a mechanical engineering faculty member is overseeing the research. Honors students may also use their honors research (MEEG 4903H) as a technical science elective but a maximum of three hours of research (honors or otherwise) may be used.

Engineering Electives. The acceptable Engineering Electives that may be used for technical science elective credit include all engineering or computer science and computer engineering courses at or above the 3000 level not already required in the mechanical engineering curriculum. Courses with content remedial to required courses are not allowed and courses considered redundant to required courses are not allowed. In addition, students may use CSCE 2004 Programming Foundations I as a three hour technical science elective.

Science Electives. The following approved science courses will be accepted as a technical science elective:

Chemistry

2262	Analytical Chemistry Lecture
2272	Analytical Chemistry Lab
2613	Organic Physiological Chemistry
3113	Intermediate Inorganic Chemistry
3453	Elements of Physical Chemistry
3451L	Elements of Physical Chemistry Lab
3504	Physical Chemistry I
3514	Physical Chemistry II
3512L	Physical Chemistry Laboratory
3603	Organic Chemistry I
3613	Organic Chemistry II

Physics

3113	Analytical Mechanics
3414	Electromagnetic Theory
3544	Optics
3614	Modern Physics
4073	Intro to Quantum Mechanics

Math
3083 Linear Algebra
3423 Advanced Applied Math

2.4 Humanistic Social Science Electives Each student in Mechanical Engineering is required to complete 18 semester hours in the humanities and social sciences. Figure 2 shows a table that must be followed when selecting these courses. This table shows that students must complete three hours of history from Column A, three hours of humanities from column B, PHIL 3103 from Column C, six hours of social sciences from Column D, and three hours of economics from Column E. Note that students may not receive credit for both ECON 2143 and ECON 2023. It is imperative that students follow this table when selecting courses. Students that deviate from this table when selecting humanistic social sciences will not be permitted to graduate.

MEEG Hum/Soc Electives Option Sheet

SELECT ONE COURSE	SELECT TWO COURSES One from Column B & One from Column C		SELECT THREE COURSES Two from Column D & One from Column E From at Least Two Different Departments	
Column A	Column B	Column C	Column D	Column E
HIST 2003	ARCH 1003	PHIL 3103	AGEC 1103	ECON 2143
HIST 2013	ARHS 1003		AGEC 2103	ECON 2013
PLSC 2003	COMM 1003		ANTH 1023	
	DANC 1003		ECON 2023	
	DRAM 1003		GEOG 1123	
	LARC 1003		GEOG 2003	
	MLIT 1003		HESC 1403	
			HESC 2413	
			HIST 1113	
			HIST 1123	
			HIST 2003	
			HIST 2013	
			HUMN 1114H	
			HUMN 2114H	
			PLSC 2003	
			PLSC 2013	
			PLSC 2203	
			PSYC 2003	
			RESM 2853	
			RSOC 2603	
			SOCI 2013	
			SOCI 2033	

Note: Students may not take both ECON 2143 & ECON 2023.

Figure 2 Hum/Soc Sheet

2.5 Creative Project Each student in Mechanical Engineering is required to complete a capstone senior design project known as creative project. Before signing up for creative project, students must first identify a project and a project advisor. In selecting a project, students should approach a mechanical engineering faculty member and ask if he or she would be willing to serve as project advisor for their project. Project ideas may come from individual faculty or

come from the students themselves. In addition, the mechanical engineering department has three ongoing projects that students may sign up for and use as their creative project. These include the Mini Baja Project, the Design Build and Fly Airplane Project, and the Solar Boat Project. Students interested in Mini Baja should contact Mr. Monty Roberts, students interested in the Airplane Project should contact Dr. Adam Huang, and students interested in the Solar Boat Project should contact Dr. Bill Springer.

2.6 Program Options One of the advantages of being a mechanical engineer is the breadth of employment opportunities that are available upon graduation. The curriculum of this department provides the student many options in preparing for his or her career. In an attempt to give the student some guidelines in this area, the department offers the student eight informal options. These options are mechanical systems, materials, thermal systems, aerospace, management, premedical, math, and physics. Some options may require the student to take more than 124 hours total.

Mechanical Systems. Mechanical Systems is one of the most popular options within mechanical engineering. Mechanical engineering designers are responsible for the design of machines that produce useful work. The courses available in this option support the needs of an individual interested in designing machines or mechanisms for industry.

Materials. The materials option is designed to give students more exposure to development and selection of engineering materials. Topics in this area include surfaces, finishes, material properties, and tribology.

Thermal Systems. Students interested in areas such as power generation, fluid mechanics, heating and cooling, engines and propulsion, air conditioning, pumps, turbines, and fans should consider this option. Many opportunities exist throughout all industries for students electing this option.

Aerospace. The Aerospace option in mechanical engineering provides students an opportunity to concentrate on engineering and scientific issues associated with spacecraft and space exploration. Students interested in this option are encouraged to visit the mechanical engineering office for more details.

Management. Most mechanical engineers will start in an entry-level engineering position and then move into a management position or an advanced engineering position later in their careers. Students interested in management should consider this option. With prior approval students can apply upper level management courses towards technical science electives. These upper level management courses are also courses that count towards a minor in business.

Premedical. Students who are considering medical school after graduation are encouraged to look into the premedical option. Some of the courses required for medical school may also count towards technical science electives in the mechanical engineering curriculum.

Math or Physics. Many students have an interest in studying math or physics at a higher level. For these students some of the courses required for a math or physics minor may also be used for technical science elective credit in the mechanical engineering curriculum.

3. ADVISING

Section 3 discusses the assignment of advisors, student records, and the advising procedures used by the Mechanical Engineering Department.

3.1 Assignment of Advisors Assignment of advisors occurs during a student's freshmen year or the first year as a transfer student.

Freshmen. Freshmen in Mechanical Engineering are assigned to a mechanical engineering faculty advisor. The students will keep this faculty member as their advisor throughout their college career.

Transfer Students. All transfer students are initially advised by the mechanical engineering undergraduate coordinator. After this first advising session, the students are then assigned to another faculty member. The students will keep this faculty member as their advisor throughout their college career.

3.2 Student Records When a student enters mechanical engineering a Degree Evaluation Form (DEF) is created for the student. The DEF lists by semester the entire mechanical engineering curriculum. Completed courses are indicated on the DEF. The DEF is updated twice a year. Once in August for courses completed in the spring and summer semesters and once in December for courses completed in the fall semester. The DEF is used by the advisor to help the student select courses for future semesters. In addition to completed courses, the DEF also contains other information pertinent to advising such as grade point average and allowable D's.

3.3 Advising Procedure Class selection and unique problems or questions a student may have during advising are discussed in the following paragraphs.

Class Selection. Starting two weeks before open registration the DEFs are printed and submitted to each advisor. The students will then meet with their advisor and go over the DEF and pick appropriate classes. A Mechanical Engineering Worksheet (MEW) is filled out by the student and advisor. This form lists the courses that the advisor recommended the student to take. Both the student and the advisor sign the MEW. The MEW is turned into the office staff and at that point their advising hold is removed by the office staff. After the advising hold is removed, the student then registers for classes. The MEW is filed for future reference for the purpose of dealing with misadvising issues if they occurred.

Unique Problems or Questions. Students with unique problems or questions are directed to the undergraduate coordinator. The undergraduate coordinator will meet with the student and discuss the problem or question to resolve the issue.

4. REGISTERING FOR CLASSES

Students register for classes through the University's Integrated Student Information System (ISIS). If there are issues that will prevent the student from signing up for a class through ISIS, they may be able to register for classes through the use of an override form. Both of these topics are discussed in the following paragraphs.

4.1 ISIS After a student has been advised and his or her advising hold has been removed, the student may register for classes using ISIS. Students may go to the University of Arkansas's web site at uark.edu to learn how to use ISIS and to learn more about the amount and type of information that is available to them through ISIS. To learn how to register for classes click on "index" then "R", then "Registration Instructions". This page has links to directions and tutorials concerning ISIS.

4.2 Course Overrides Issues involving pending transfer credits or pre- and co-requisite problems or time conflicts are resolved through the use of an override form. In these cases the students will fill out the override form, obtain the course instructor's signature, and submit the form to the office staff. The office staff will take the override form from the student and ensure that the form was filled out properly. Then the office staff will obtain the undergraduate coordinator's signature. The form is then submitted to the dean's office and the student is placed in the appropriate course as listed on the override form.

5. DEGREE CHECKS

Each student will be given at least two degree checks before they graduate as discussed in the following paragraphs.

5.1 Pre Degree Check Twice a year a pre degree check is completed by the undergraduate coordinator on seniors who will be graduating the following semester. A pre degree check is completed in January for students graduating in the spring and summer semester and in August for students graduating in the fall semester. The pre degree check is completed before classes begin in case there are any last minute problems that need to be corrected before classes start. This gives the students time to drop or add courses before their final semester begins. After the pre degree check is completed the students are notified via email of their remaining graduation requirements.

5.2 Final Degree Check Twice a year a final degree check is completed by the undergraduate coordinator on seniors who have applied for graduation. A final degree check is completed in May for students graduating in the spring and summer semester and in December for students graduating in the fall semester. After the final degree check is completed, the DEF is signed by the undergraduate coordinator and then submitted to the associate dean of academics.

6. STUDENT SOCIETIES

There are many ways that a student may become active with the mechanical engineering department and the mechanical engineering student body. One such way is through student societies. There are three student societies in Mechanical Engineering. These include Pi Tau Sigma, the American Society of Mechanical Engineers (ASME), the American Institute of Aeronautics and Astronautics (AIAA), and the Society of Automotive Engineers (SAE). Students interested in joining one or more of these student societies should contact the following advisors:

Pi Tau Sigma	Dr. Rick Couvillion
ASME	Dr. Rick Couvillion
AIAA	Dr. Adam Huang
SAE	Mr. Monty Roberts