MAE 1351: Introduction to Engineering Design
Spring 2016

1. Instructor & contact information:

Dr. Raul Fernandez
ELB 253 - 817-272-2561 - fernandez@uta.edu - https://www.uta.edu/profiles/dr-raul-fernandez

2. Office Hours: Dr. Fernandez holds office hours immediately after MAE 1351 lecture periods as noted below—six times per week. No need for appointments; simply approach the podium when class is over for quick consultations (first-come first-served), or we will walk to my office if extended or private conversation is needed. For quick technical or procedural consultations, students may also approach a TA during any lab period.

3. Section Information / Class Meetings

Lecture sections:	001 - TR 08:00-08:50	– Dr. Fernandez (NH 105)
	002 - TR 11:00-11:50	– Dr. Fernandez (NH 106)
	003 - TR 09:30-10:20	– Dr. Fernandez (NH 105)
	Lecture TA: Kevin (teonghong.chuah@mavs.uta.edu)	
Lab sections / TA's:	004 - R 14:00-16:50	– Joakim (joakim.lea@mavs.uta.edu)
(all in WH 406)	005 - T 14:00-16:50	– Craig (craig.conklin@mavs.uta.edu)
	006 - M 17:30-20:20	– Hayley (hayley.maynard@mavs.uta.edu)
	007 - R 17:30-20:20	– Danny (senghong.voon@mavs.uta.edu)
	008 - W 17:30-20:20	– Leonardo (leonardo.pinero-perez@mavs.uta.edu)
	009 - W 14:00-16:50	– Danny (senghong.voon@mavs.uta.edu)

4. Description of Course Content: Foundational course in product design and manufacturing using computer-based methodologies. 3D parametric solid modeling of parts and assemblies. Technical sketching, 2D schematics, and ASME Y14 engineering drawing standards. Industrial practices for product design and fabrication. Introduction to 3D product analysis tools.

5. Student Learning Outcomes: At the end of the course, students will be able to:

5.1. Describe the phases of engineering design and its iterative, living nature.
5.2. Identify appropriate materials and manufacturing candidates for the design of common components.
5.3. Utilize industry-standard parametric solid modelers for geometry creation and design analysis.
5.4. Draw freehand sketches of parts in axonometric, oblique, perspective, and orthographic representations.
5.5. Interpret and create engineering drawings per ASME Y14.5 and model-based definition sets per Y14.41.
5.6. Apply basic conventional and geometrical tolerances.

6. Required Textbooks and Other Course Materials:

6.1. Visualization, Modeling, and Graphics for Engineering Design 1st Ed, ISBN: 9781401842499, print or digital. Make sure you have a version of the textbook that has all the required chapters (see *Course Schedule*).
6.2. i>clicker 2, ISBN 1-4292-8047-6; alternatively, i>clicker REEF (smartphone app).

7. Descriptions of major assignments and examinations:

7.1. Six in-class exams, of which the last is a comprehensive final exam.
7.2. Weekly homework assignments.
7.3. Daily i>clicker questions for attendance & participation credit.

8. Attendance: As the instructor of these sections, I grade attendance and participation but this is not a requirement to pass the course. The attendance and participation score is based strictly on use of the i>clicker device.

9. Grading:

70%	Exams. All equally weighed. Lowest grade is dropped (it can be the final exam).
20%	Homework. All homework is equally weighed and lowest grade is dropped.
10%	Attendance / participation. Two class periods are dropped.

Letter grading scale: **A:** 90-100%; **B:** 80-89.9%; **C:** 70-79.9%; **D:** 60-69.9%; **F:** <60%

Homework scoring: homework points are primarily awarded based on evidence of effort, organization, and willingness to complete the entire assignment following the requested format. The grading is stair-stepped in increments based upon these criteria:

- 100%: every problem attempted and substantially completed; followed directions as requested, including format and layout; clear evidence of effort.
- 80%: most homework turned in and evidence of effort present, but not deserving of full credit due to: not substantially completed or lacking a credible attempt at every problem; low standard of workmanship; not following expressly requested directions, whether regarding content or format / layout.
- 60%: some homework turned in; some effort / several problems attempted, but clearly showing that not enough time was applied.
- 25%: some homework turned in; marginal effort; only a few trivial problem(s) completed; only deserving of minimal credit.
- 0%: not turned in via Blackboard (email submissions are not accepted); turned in a minimal amount of homework; very poorly completed and undeserving of any credit.

Check first with TA about homework: homework grade inquiries must first be directed to your assigned lab TA, who will explain the reasoning. If questions remain, they should never be argued with the TA but rather brought to the instructor with written documentation (e.g., TA comments) for a final decision.

Limited grade change period: any questions about exam, homework or attendance grades must be brought to the professor's attention in person during office hours—not via email—within two weeks of being posted in Blackboard; after that time period, they will not be changed.

Borderline grade policy: final grades within approximately half a point below 90, 80, 70, and 60 may be rounded up if the student has taken the final exam and demonstrated a pattern of improvement and an effort to earn the higher grade. There is no mechanism to turn in extra assignments as make-up credit.

Instructional technology policy: this class utilizes instructional technologies such as Blackboard, iclicker, and automated grading for multiple-choice exams. These rely on computer systems that have been proven overwhelmingly reliable over time. The few, sporadic system failures that may occur typically affect all users and the professor can readily identify them and compensate appropriately. Students are otherwise responsible for their technology being in working order—personal computers, smartphones, internet access, browsers, undamaged and properly filled-in test forms, iclickers, etc. Grade penalties resulting from individual technology failures will not be compensated and fall under the "lowest drop" policies; the only consideration given will be if the student submits written proof from Blackboard or iclicker technical support (e.g., an email record) ascertaining that there was a system outage or failure that affected the student entirely beyond his/her ability to manage. This must be submitted as a formal document with the evidence (tech support email trail) and comments entered by the student that explain what occurred and why credit is requested. To ensure fair handling of all requests, verbal explanations, or written explanations lacking some manner of evidence beyond the student's sole testimony, will not be accepted.

10. Expectations for Out-of-Class Study: Beyond the time required to attend each class meeting, students enrolled in this course should expect to spend at least an additional 9 hours per week of their own time in course-related activities (Fall/Spring sessions; proportionally higher in summer sessions), including reading required materials, completing assignments, preparing for exams, etc. Students are expected to review the pre-recorded video lectures prior to coming to class.

It is always proper to approach the professor with specific technical questions, particularly once an honest attempt at self-answering has been made. By contrast, it is not proper to ask the professor to recreate the contents of a lecture you did not or could not attend ("what did I miss?" or "can you send me what you went over?"). In the event of an absence, students are expected to seek information regarding the missed class from fellow classmates; of course, important announcements are made available to all through Blackboard.

11. Make-up Policy: In order to ensure fair and equal treatment of all students, make-up opportunities for exams and homework do not exist and are covered instead by the "lowest drop" policies—which apply regardless of reason. Homework in particular is exactly due as noted in Blackboard, can only be submitted through Blackboard, and otherwise falls under the "lowest drop" policy. Please realize that this policy includes medical reasons unless the student is managing the case through the Office for Students with Disabilities (see Section 14), or a request for an "incomplete" grade is made and coordinated with an academic advisor due to extenuating circumstances preventing the student from completing the semester.

12. Grade Grievances: Any appeal of a grade in this course must follow the procedures and deadlines for grade-related grievances as published in the current undergraduate catalog (link below). http://catalog.uta.edu/academicregulations/grades/#undergraduatetext. This mechanism notwithstanding, the professor will gladly address any questions regarding final grades during office hours—not via email—in the following semester, usually right after lecture periods; please check syllabus or class schedule available through the UTA website.

13. Drop Policy: Students may drop or swap (adding and dropping a class concurrently) classes through self-service in MyMav from the beginning of the registration period through the late registration period. After the late registration period, students must see their academic advisor to drop a class or withdraw. Undeclared students must see an advisor in the University Advising Center. Drops can continue through a point two-thirds of the way through the term or session. It is the student's responsibility to officially withdraw if they do not plan to attend after registering. **Students will not be automatically dropped for non-attendance**. Repayment of certain types of financial aid administered through the University may be required as the result of dropping classes or withdrawing. For more information, contact the Office of Financial Aid and Scholarships (http://wweb.uta.edu/aao/fao/).

14. Disability Accommodations: UT Arlington is on record as being committed to both the spirit and letter of all federal equal opportunity legislation, including *The Americans with Disabilities Act (ADA), The Americans with Disabilities Amendments Act (ADAAA),* and *Section 504 of the Rehabilitation Act.* All instructors at UT Arlington are required by law to provide "reasonable accommodations" to students with disabilities, so as not to discriminate on the basis of disability. Students are responsible for providing the instructor with official notification in the form of a letter certified by the **Office for Students with Disabilities (OSD).** Students experiencing a range of conditions (Physical, Learning, Chronic Health, Mental Health, and Sensory) that may cause diminished academic performance or other barriers to learning may seek services and/or accommodations by contacting:
The Office for Students with Disabilities, (OSD) www.uta.edu/disability or calling 817-272-3364.
Counseling and Psychological Services, (CAPS) www.uta.edu/caps/ or calling 817-272-3671.

Only those students who have officially documented a need for an accommodation will have their request honored. Information regarding diagnostic criteria and policies for obtaining disability-based academic accommodations can be found at www.uta.edu/disability or by calling the Office for Students with Disabilities at (817) 272-3364.

15. Title IX: The University of Texas at Arlington does not discriminate on the basis of race, color, national origin, religion, age, gender, sexual orientation, disabilities, genetic information, and/or veteran status in its educational programs or activities it operates. For more information, visit uta.edu/eos. For information regarding Title IX, visit www.uta.edu/titleIX.

16. Academic Integrity: All students enrolled in this course are expected to adhere to the UT Arlington Honor Code:

I pledge, on my honor, to uphold UT Arlington's tradition of academic integrity, a tradition that values hard work and honest effort in the pursuit of academic excellence.

I promise that I will submit only work that I personally create or contribute to group collaborations, and I will appropriately reference any work from other sources. I will follow the highest standards of integrity and uphold the spirit of the Honor Code.

UT Arlington faculty members may employ the Honor Code as they see fit in their courses, including (but not limited to) having students acknowledge the honor code as part of an examination or requiring students to incorporate the honor code into any work submitted. Per UT System *Regents' Rule* 50101, §2.2, suspected violations of university's standards for academic integrity (including the Honor Code) will be referred to the Office of Student Conduct. Violators will be disciplined in accordance with University policy, which may result in the student's suspension or expulsion from the University.

Definitions of academic dishonesty are found in the link below:
http://www.uta.edu/engineering/current-students/academic-honesty.php

Dr. Fernandez's statement: *Academic dishonesty is a serious matter with serious consequences to your grade, degree, career and life. UT Arlington academic integrity standards are strictly upheld in this course. At times you may feel the temptation to cheat in order to raise your grade or lower your burden. If you find yourself thinking "just this once," "it's a small matter," "nobody will notice," "I really need it," etc., RESIST and STOP. Submit only work that you have completed yourself. Never attempt to misrepresent work as yours that you have not personally completed; however minor it may seem to you, doing so is a violation of the honor code and is grounds for heavy penalties. There will be no "warnings" – this syllabus IS your warning. Be mindful that there is no such thing as a "small" violation. Every violation, regardless of magnitude, carries within it an implicit message that you may be willing to violate the honor code given the appropriate circumstances.*

Engaging in academic dishonesty is lying to yourself first and foremost, and it is also lying to the UT Arlington academic community—your student peers, the faculty and the staff. It's not worth taking the risk—I've seen this happen enough times to know. Your character is not measured by the sincerity of your contrition if caught, but by acting with steadfast integrity and honesty every day, long before any of it becomes an issue. Examples of academic dishonesty include, but are not limited to:

Homework:
- *submitting homework that you have not personally completed in full*
- *giving your homework results for someone else to copy*
- *rote copying of past semesters' homework, however acquired*
- *submitting homework completed by someone other than yourself and attempting to make them look different—i.e., disguise them as yours—by performing minor changes or touchups ("photoshopping.")*
- *working together on homework and submitting the same work output under multiple names*

Attendance and participation:
- *using the classroom response system (iclicker) for someone other than yourself*
- *using the classroom response system remotely, without being physically present in class*
- *falsely representing that you are present in class or abetting someone else in doing so, by whatever means*

Exams:
- *peeking and looking at someone else's responses*
- *communicating in any manner with someone else*
- *giving, receiving or borrowing any items to/from someone else*
- *using any technology or items that have not been explicitly approved by the professor*
- *removing any exam papers from the examination room*
- *using any technology whatsoever for capturing or recording the contents of an exam paper*

17. Student Support Services: UT Arlington provides a variety of resources and programs designed to help students develop academic skills, deal with personal situations, and better understand concepts and information related to their courses. Resources include tutoring, major-based learning centers, developmental education, advising and mentoring, personal counseling, and federally funded programs. For individualized referrals, students may visit the reception desk at University College (Ransom Hall), call the Maverick Resource Hotline at 817-272-6107, send a message to resources@uta.edu, or view the information at http://www.uta.edu/universitycollege/resources/index.php.

18. Electronic Communication: UT Arlington has adopted MavMail as its official means to communicate with students about important deadlines and events, as well as to transact university-related business regarding financial aid, tuition, grades, graduation, etc. All students are assigned a MavMail account and are responsible for checking the inbox regularly. There is no additional charge to students for using this account, which remains active even after graduation. For information about MavMail see http://www.uta.edu/oit/cs/email/mavmail.php.

The above notwithstanding, Blackboard is used to manage all class-related activity in this particular course, including announcements, homework, supporting materials, and general questions; students are expected to log on to Blackboard and stay informed regularly. Dr. Fernandez always welcomes individual questions from students, but asks that these not be handled via email. Email is not an effective medium of communication for large enrollment courses such as this one. Instead, approach Dr. Fernandez in person during office hours, or for technical consultations, feel free to talk to a TA during a lab section as well (even if not your own). **PLEASE COME SEE DR. FERNANDEZ IN PERSON INSTEAD OF SENDING EMAIL; IF YOU SEND EMAIL, EXPECT NO ACKNOWLEDGMENT, ACTION, OR UNDERSTANDING THAT COMMUNICATION OR AGREEMENT WITH DR. FERNANDEZ ON ANY TOPIC HAS TAKEN PLACE.**

Similarly, please also be considerate with communication in any form outside lectures, labs and office hours. Your professor and TA's are here to assist you, but they are not technical support or 24/7 "customer service associates." We have many other responsibilities to fulfill. Modern electronic communications make it easy to issue and "park" requests around the clock with an expectation of action, even immediacy. We are not set up to service you in such a manner. Instead, bring your questions to class (best so that everyone can benefit from the answer), come during office hours, or run them by the TAs; opportunities to do this abound throughout the week. **ONE MORE TIME: DO NOT RELY ON EMAIL FOR COMMUNICATIONS (UNLESS SPECIFICALLY ARRANGED WITH YOUR PROFESSOR OR TEACHING ASSISTANT). WE'LL HAPPILY HANDLE YOUR INQUIRIES IN PERSON.**

19. Student Feedback Survey: At the end of each term, students enrolled in classes categorized as "lecture," "seminar," or "laboratory" shall be directed to complete an online Student Feedback Survey (SFS). Instructions on how to access the SFS for this course will be sent directly to each student through MavMail approximately 10 days before the end of the term. Each student's feedback enters the SFS database anonymously and is aggregated with that of other students enrolled in the course. UT Arlington's effort to solicit, gather, tabulate, and publish student feedback is required by state law; students are strongly urged to participate. For more information, visit http://www.uta.edu/sfs. **Students in this course are required to provide proof of having visited the SFS page in order to receive credit for the homework assignment(s) noted in the *Course Schedule*.**

20. Final Review Week: A period of five class days prior to the first day of final examinations in the long sessions shall be designated as Final Review Week. The purpose of this week is to allow students sufficient time to prepare for final examinations. During this week, there shall be no scheduled activities such as required field trips or performances; and no instructor shall assign any themes, research problems or exercises of similar scope that have a completion date during or following this week *unless specified in the class syllabus*. During Final Review Week, an instructor shall not give any examinations constituting 10% or more of the final grade, except makeup tests and laboratory examinations. In addition, no instructor shall give any portion of the final examination during Final Review Week. During this week, classes are held as scheduled. In addition, instructors are not required to limit content to topics that have been previously covered; they may introduce new concepts as appropriate.

21. Emergency Exit Procedures: Should we experience an emergency event that requires us to vacate the building, students should exit the room and move toward the nearest exit, whose location is described in class. When exiting the building during an emergency, one should never take an elevator but should use the stairwells. Faculty members and instructional staff will assist students in selecting the safest route for evacuation and will make arrangements to assist individuals with disabilities.

22. Course Schedule:

Wk	Date	HW	Book	Lecture topic
1	01/19/16		-	VL0.1 Course syllabus
			5.04; 1.02,04,05	VL0.2 The engineering design process and the role of graphics
2	01/26/16	HW01	6.03	VL1.1 Introduction to part modeling; linear and revolved extrusions
			6.04-06	VL1.2 Sketch constraints; parametric/relational modeling
3	02/02/16	HW02	6.07,08	VL1.3 Features; reference geometry; patterns; sweeps and lofts
				EXAM 1
4	02/09/16	HW03	17.02-04,06-12	VL2.1 Engineering materials and mechanical fastening: designing with COTS
			9.02,03	VL2.2 Manufacturing technologies (1 of 2)
5	02/16/16	HW04	9.04-07	VL2.3 Manufacturing technologies (2 of 2)
			7.02,03	VL3.1 Introduction to assembly modeling; hierarchy and degrees of freedom
6	02/23/16	HW05	7.04	VL3.2 Assembly mates
				EXAM 2
7	03/01/16	HW06	8.05; 7.06	VL4.1 Analysis (1 of 2): geometrical and mass properties; interference
			8.06,07	VL4.2 Analysis (2 of 2): rigid-body dynamics, finite element analysis
8	03/08/16	HW07	2.2-5,7-10	VL5.1 Hand-sketching principles
			12.02-04	VL5.2 Pictorials: axonometric, oblique, and perspective
9	03/15/16	-		Spring Break
				Spring Break
10	03/22/16	HW08		**EXAM 3**
			10.02-05	VL6.1 Orthogonal projections; standard views; view selection
11	03/29/16	HW09	18.2-5	VL6.2 Working drawings: sheet sizes, organization, headers, standard practices
			13.2-7,9,11; 14.2	VL6.3 Section views: full, offset, half, removed, broken out; auxiliary views
12	04/05/16	HW10	7.05,07; 18.06	VL6.4 Assembly drawings: exploded configurations and bill of materials
				EXAM 4
13	04/12/16	HW11	15.03-10	VL7.1 ANSI Y14.5 dimensioning for design; standards, definitions, rules
			15.12	VL7.1 ANSI Y14.5 continued
14	04/19/16	HW12	16.01-04	VL7.2 Introduction to linear tolerancing; ANSI B4.1 shaft/hole tolerancing
			16.06	VL7.3 ANSI Y14.5 geometric tolerancing
15	04/26/16	HW13	16.07	VL7.3 ANSI Y14.5 continued; ANSI 14.41 Model Based Definition
				EXAM 5
16	05/03/16	HW14		Design project showcase
				Design project showcase
17	05/10/16			**EXAM 6**: sect 001, 002 on Tue, sect 003 on Thurs, regular class time & venue.

NOTE: Each week has two lines, one for each lecture day. Lecture days have associated video lecture (VL) and book reading assignments (noted in chapter.section format; for example, "21.01-04,06,12-14" would mean ch 21, sects 1 through 4, (skip sect 5), sect 6, (skip sect 7 through 11), and sects 12 through 14). Weekly homework assignments (HW) are due at 5 pm on Friday unless otherwise stated in Blackboard.

As the instructor for this course, I reserve the right to adjust this schedule in any way that serves the educational needs of the students enrolled in this course. –Raul Fernandez.

23. Key Assignment: Assignment HW14 **must be completed**, along with evidence of having visited the online course evaluation page, in order to get a grade for this course (see *Student Feedback Survey* this syllabus).

Rev. 01/01/2016: First release.

In case of an on-campus emergency, call UTA Police at **817-272-3003** or dial 911 (non-emergency 817-272-3381).