Spring 2017
Engineering Design Project

David A. Wetz, Ph.D.

Catalog Course Description:
EE4349 Engineering Design Project (0-3)
A practicum resulting in the design, construction, and evaluation of a device or system, building on electrical or electronic knowledge and skills acquired in earlier course work, and incorporating appropriate engineering standards. The application of project management techniques in order to meet design specifications through the effective allocation of team resources, scheduling, and budgetary planning. The demonstration of the finished product/prototype through both oral presentation and a written project report. Mode of Instruction: Practicum.

Pre-Requisite:
EE4340, Concepts and Exercises in Engineering Practice
Grade of C or better in EE 4340. Grade of C or better in all prior 3000 and 4000 level EE coursework.

Instructor:
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Office Hours: M-W 2:00 P.M – 3:20 P.M. I have an open door policy so please feel free to stop by my office or lab any time. If I am able, I am happy to help.

(To ensure proper prioritization and prompt attention, MUST include "EE4349 # where # is your Project ID" as the first text in SUBJECT section of all e-mail)

Course Website: http://www-ee.uta.edu/hpi/EE_4349/
Note that this is currently a common website – to be shared by all EE4349 sections. However, students should consult the syllabus for their respective section as some differences in policies may occur.

Section Information:
EE4349-002

Times and Location:
Monday and Wednesday
9:30 A.M. – 12:20 P.M.
NH 130

Required Textbook:
None

Project Assignment:
Students will continue with and complete projects assigned during EE4340. If students were not assigned projects during EE4340 in the previous semester they will bid for and be assigned to projects and teams immediately after the first class period.

DUE DATES:
Midterm ppt. presentations due Sunday March 5th by midnight to Blackboard
Midterm presentations will be given on Wednesday March 8th during class (20 minutes each group)
Midterm reports are due March 19th by midnight to Blackboard
Final ppt. presentations and poster files are due Sunday April 30th by midnight to Blackboard
Final presentations will be given on Monday May 1st during class
Final demonstrations will be given on Wednesday May 3rd during class
Final reports are due by Tuesday May 9th by midnight to Blackboard
Final CDs, notebooks, and deliverables must be turned in by 12:00 PM on May 9th to ELB 126

There will be three peer evaluations due to Blackboard at the end of each month (Feb, March, and April)

Design Constraints:
The system/device(s) must be designed and constructed by the team. Commercial products may not be purchased and reverse engineered, but reference to texts and outside sources is highly encouraged. This design constraint against reverse engineering also applies to sub-assemblies within the project. Don't plagiarize, it isn't worth it.

Similarly, the design must be built using discrete components. That is, kits may not be purchased and integrated into the design unless specifically approved in writing by the course instructor and project sponsor. The purchase of individual IC chips to perform desired functions is within the scope of the project. As needed, subassemblies such as microprocessor development boards may be purchased and integrated into the project as approved by the project sponsor and course instructor.

Grading:
Each project has a sponsor, considered to be "the customer" or client. Thus, the project is expected to produce a real-world deliverable of interest and value to the project sponsor – and is not simply an academic exercise. The project grade will be determined from performance on several key identified elements of the course. **You are working as a group but will be graded individually so don't expect your group to carry you.** It is expected that each student will carry his or her own weight and that you will work together as a team. This course is intended to model the real world and that is how it will be when you leave UTA. It is recognized that each individual project can have different progressions depending on both the project and team members. This more professional, real-world framework, along with the desire to encourage thoroughness and completeness in your work, guided the development of the grading rubric for EE4349, which is described below.

Grading Approach and Considerations:
Team performance is no doubt important. However, there is a range of possibilities regarding what individual members contribute. Ideally, all members would contribute equally to each project and each team member's grade would be the same as the team grade. Since this is not always the case, it is necessary for the grading process and rubric to incorporate elements that reasonably reflect individual contributions to determine meaningful individual grades.

Determination of a Team Grade:
A team grade will be determined by performance in several key aspects of the course. Final grading will not be the simple sum of graded components with different weights, as it can be demonstrated that this approach can produce final results that do not properly reflect actual performance.

Rather, a criterion-based approach is utilized that is centered on the course deliverables. These are grouped into categories and the performance within each category is evaluated. Each category is outlined as follows:

Hardware/Software Performance: This includes how well the specifications of the project were achieved. It also includes physical appearance and packaging. Does "it" work (i.e., were the system performance specs generally met) or not? If not, what level of functionality and performance was achieved?

Presentation Performance: The primary element of this component is the video presentation of the project with emphasis on demonstrating the results obtained. In addition, face-to-face presentations to the course instructors and project sponsor are considered. The rubric employed in EE4340 for creation and evaluation of oral presentation will serve as the basis for evaluating EE4349 presentations, with continued emphasis on both content and format.

Documentation Package Performance: Completeness and quality of: 1) the information to be submitted on the CD/DVD deliverable, which is described on the course website, and 2) laboratory notebooks.

Work Practices Performance: This category includes items and performance distributed over the entire semester. This includes: 1) planning - and submission of a revised project plan early in the semester, 2) attendance at lab sessions, 3) timely submission of thoughtful and meaningful weekly reports, 4) willingness to seek, accept, and pursue constructive recommendations from instructors, and 5) consistent recording of designs, reference information, procedures, test set-ups, and data in Engineer's notebooks, etc.

The rubric for evaluating Team Performance and determining a Final Team Letter Grade is based on these categories and is summarized in the table below. This is not the final *individual* grade.

Note that performance in each of these categories is not completely independent. Thus, it is relatively unlikely, for example, for a team to exhibit acceptable performance in the presentation category and unacceptable performance in all other categories.

Rubric Used as the Guideline for Determination of Final Team Grade

Hardware/ Software Performance	Documentation Package Performance	Presentation Performance	Work Practices Performance	Letter Grade
1	1	1	1	A
1	1	1	0	B
1	1	0	1	B
1	1	0	0	C
1	0	1	1	Borderline D-C (can possibly drive to C or better with timely revision of Documentation Package)
1	0	1	0	Borderline D-C (can possibly drive to C or better with timely revision of Documentation Package)
1	0	0	1	Borderline D-C (can possibly drive to C or better with timely revision of Documentation Package)
1	0	0	0	Borderline D-C (can possibly drive to C with timely revision of Documentation Package)
0	1	1	1	Borderline D-C (C more likely, but depends on further analysis of hardware/software)
0	1	1	0	Borderline D-C (D - more likely and final; too late to rectify poor work practices)
0	1	0	1	Borderline D-C (depends on further analysis of hardware/software, unusual circumstances)
0	1	0	0	D (this combination is less likely to occur in practice)
0	0	1	1	D (this combination is less likely to occur in practice)
0	0	1	0	F (this combination is less likely to occur in practice)
0	0	0	1	F
0	0	0	0	F

Note: "1" – Minimally Acceptable ("Good or Better") Quality or Performance
"0" – Unacceptable ("Poor or Worse") Quality or Performance

Determination of Individual Grades:
The Team Grade is the starting point for determination of Individual Grades. Individual Performance will be determined by a combination of peer reviews (i.e., evaluation by your team members, similar to evaluations utilized in EE4340), a student's Engineer's notebook, lab session attendance and work methods, and collective observation made by instructors during weekly lab interactions. Each team member is expected to have individual, defined responsibilities and these play a significant role in the judgments of contributions/performance offered by peers and instructors.

A final evaluation of Individual Performance will be determined (0 – "poor or worse", 1 – "adequate – meets expectations", 2 – "superior or better"). It is difficulty to codify the exact criteria for each of these categorizations. Instructors will attempt to clarify expectations when working with individual teams and team members. Students are encouraged to discuss expectations regularly within the team and with instructors.

The following table will be used as a guideline for determining a given student's final grade.

Rubric Used as the Guideline for Determination of Individual Grades

Team Grade	Individual Performance	Individual's Final Grade
A	0	F or D
A	1	A or B
A	2	A
B	0	F or D
B	1	B or C
B	2	A
C	0	F or D
C	1	C
C	2	B
D	0	F
D	1	Unlikely Case*, but C or D possible
D	2	Unlikely Case*
F	0	F
F	1	Unlikely Case*, but C or D possible
F	2	Unlikely Case*

* If at least one team member meets or exceeds expectations, it is highly unlikely that the Team Grade will be less than "C". In the rare cases when this may occur, experience indicates that there are typically unusual factors involved. It is not feasible to provide a rubric that covers all such cases. Individual grades will be determined in such situations on a case-by-case basis in a manner consistent with principles underlying the above rubrics.

Interim Grades:
Interim letter grades will be determined employing the integration of available information using the grading rubrics described below and communicated to each student after the interim report and presentation are submitted. They will reflect "status/progress at that point in time". The final grade, however, will be independently determined and depend most heavily on the final results as determined by performance in the categories listed in the above rubrics at the end of the semester Thus, poor performance – and poor grades - at intermediate points *provide warnings* that students are on a path that needs immediate attention and correction. These may, as well, support in part a final grade reflecting a poor final result.

If a successful final result is delivered, final grading can take precedent over poor intermediate grades (at the discretion of the instructor) thereby providing an opportunity to earn a very good final grade. However, students are strongly discouraged from thinking that this approach is a viable substitute for good performance in the first half of the course. Likewise, good intermediate grades are no guarantee of a good final grade. It is considered, however, that it will be more likely for a team to meet final objectives if intermediate objectives are met and steady progress is made (and this will be reflected by intermediate grades). Again, these principles reflect what happens in the real world you are preparing to enter.

Elements Contributing to Grading:
Class Attendance and Sign-In/Sign-Out: At the University of Texas at Arlington, taking attendance is not required. Rather, each faculty member is free to develop his or her own methods of evaluating students' academic performance, which includes establishing course-specific policies on attendance. As the instructor of this section, attendance is considered mandatory unless the instructor is notified ahead of time and a good reason is given. Scheduled class time is not only an opportunity for the team to work together, but is also critical for instructor interaction, evaluation of progress, and problem solving. One unexcused

absence will be accepted with no impact, but **no more will be tolerated**. A form will be available during the regularly scheduled lab times for students to sign-in and sign-out. This will document attendance/work during these time periods.

Engineer's Lab Notebook: In keeping with standard industry practice, each student must keep a formal Engineer's Notebook during the execution of this project. The volume must be bound so that pages cannot be removed. All work performed on the project should be documented in the Notebook. PROJECT NOTEBOOKS will contribute significantly to determining individual team member performance. All entries must be dated. This will support determination of intermediate and final grades.

Weekly Reporting:
Each team must update their Gantt chart weekly on blackboard

In addition, teams should provide this information to the project sponsor. Teams are encouraged to meet weekly with project sponsors and to bring a hard copy of their typed written weekly report with them to this meeting. It is understood that not all project sponsors will want to meet on a weekly basis and the instructor will determine the intent of individual sponsors. Nonetheless, *some* (but not *none*) periodic meeting with your project sponsor is expected during the course of the semester and weekly reports should accurately reflect the essence of such meetings.

In addition, at least once every other week, the instructor will request an impromptu oral report during the class session. Teams should be prepared to deliver such reports at any time. During these reports, the overall project status should be addressed, key problems identified (if any), and proposed methods of resolution described. In addition, each team member should be prepared to identify their area of responsibility and progress made since the last report (not simply what you "were working on", but *progress made*. If none, state it as so.). These reports are anticipated to last approximately 15 minutes. It is therefore necessary to be clear and concise.

Each team must select a team leader who will coordinate the team's activities. The team leader will be responsible for liaison between the team and the sponsor as well as the course instructor.

Design Reviews:
Interim Review: Each team will make a formal Design Review Powerpoint presentation to the entire class. This is targeted for about week 7-8. Teams must work to provide a complete design by this time in order to allow for sufficient time for parts acquisition, construction, testing, etc. The focus will be to describe the design of the system and should include elements such as functional block diagrams, options considered for implementing major blocks, decisions made, decisions that still need to be made, key analyses that are required to achieve the finalization of major blocks, sketches or computer drawings of final packaging concepts as well as identification of major problem areas and plans for their solution.

Interim Reports: At the same time as the interim review is given, each team is required to submit a formal report. The format of this report will be discussed in more detail in class, but each report must discuss all aspects of the project. **The reports should include an abstract, introduction, background, experimental setup/results, conclusions, reference, and schedule sections.** As such, you should consider this as an opportunity to make significant progress toward the preparation of final deliverables and avoid end-of-semester stresses due to procrastination.

Final Review: This will occur at the end of the semester either on the last day of class or during one of the scheduled final exam times. The powerpoint presentation should cover the entire project evolution – including background information used, both hardware and software components, results, conclusions, etc.

Final Report: The Final Report should be an extension of the interim report and should be sufficiently detailed to allow the project sponsor to implement and/or replicate your work. The final report should contain photos as necessary to support understanding and documentation of the project and performance verification results. You should begin working on your Final Report immediately (clearly – there are some sections that will be defined at the beginning of the semester!) and continue to develop it throughout the semester. The instructor may ask to inspect the status of your team's final report at any time.

The final report should contain the following sections:
- Cover Page (Project ID, Project Title, Team Members, Sponsor, Semester)
- Abstract
- Introduction - Description of the system/device (a brief "big picture" overview, enabling someone unfamiliar with the project to achieve a basic understanding of it and its relevance).
- Brief Background – Describe similar systems/devices and relate to the current project.

- Experimental Setup / Plan
    1. Design specifications to which the project was intended to be built,
    2. Design options considered and rationale for choice made, including decision matrices wherever applicable,
    3. Design Description/Theory of Operation - Describe in detail how the final design achieves the desired functionality and performance. Include relevant calculations (or point to relevant appendices), etc.
    4. Test Set-ups – Describe in full detail methods used to demonstrate that the project met *(or how well final result met)* design specifications.
- Experimental Results – Document any results you have with pictures, graphs, etc.
- Conclusion – Assess the final status and make recommendations, as appropriate, for follow-on work.
- References

Appendices should also be included as needed. Depending on the nature of your project and choices made regarding what is included in the main Final Report document, they should contain the following elements when applicable:

- Very detailed schematic diagrams (complete except for subassemblies, such as a microprocessor board, integrated into your design).
- Software code listing for all code developed as part of the project. This should be fully documented at multiple hierarchical levels, including: 1) a description of the purpose of each major section of code (and subprograms), including
- A Parts Layout Diagram for each circuit board, ideally linked to the schematic diagram (but this may be different for different project sponsors and their requirements).
- A Detailed Parts List (Bill of Materials), including package description (e.g., SOIC-8), Mfg. Part No., Description, Vendor Part No., and cost.
- A copy of the Project Plan, including any modifications made as the semester progressed
- A Detailed Description of each person's unique contribution to the team
- Summary of the learning accomplished as a result of performing this project
- A detailed reference list of all sources reviewed in the design of the project and cited in other documentation.
- Any additional support material deemed to be relevant to the project.

Peer Evaluations: Every month team members will submit peer evaluations of their members to the instructor via email. In addition, the entire class will evaluate formal Design Review presentations using a form provided. Peer reviews will contribute substantially to the determination of individual grades. However, the intermediate peer evaluations provide an opportunity to identify and correct potential problems and thereby improve overall team performance.

Submission of Engineering Lab Notebooks: Concurrent with the submission of the final report, all Engineering Lab Notebooks must also be submitted as hard copies or kept on the Wiki page. These will be retained for at least two weeks following end of the semester. Students may request a return of their notebook.

Final Deliverables CD/DVD: In addition to the items listed above, a Final Deliverables CD/DVD must be submitted. This package should be a "stand-alone" source, providing everything necessary for another EE - or your project sponsor - to understand your project and, if necessary or desired, carry it forward.

The CD/DVD should contain a well organized set of materials. At the root level, a Pxx_ReadMe.doc file should be included that describes everything else on the CD. Folders should be included for:

- Final Report – including Appendices (see above) (the final report folder should consist of a Final Report file .doc or .docx as well as any other source files for separate appendices).
- PCBs - This should include: 1) a Pxx_ReadMe_PCB.doc file that explains what software (including version numbers) was used to develop schematics and layout PCBs what one must know in order to fabricate PCBs, 2) Schematic file(s), 3) so-called "board" file(s) that contain the layout, and 4) all library files required.
- Software - This should include source code listing containing explanations sufficient for someone else to understand the structure and logic of the code. This includes explanations (not just "comments"!) of each major routine, assembly/compiling instructions, etc. Any support files required should also be included. Each major software component should have its materials included in separate subfolders (e.g. Pxx_HostPC_SW, Pxx_Microcontroller_SW, etc.)
- Data Sheets: PDF datasheets for ICs and any "special" components should be included. If you are in doubt regarding what constitutes a "special component", include the data sheet!
- Literature References: Include PDFs of any papers you consulted that provide useful background regarding your system. Also, include copies of papers listed in the Reference section of your report.
- Poster - This folder should contain an electronic copy of a poster describing the project

- Video - This folder should contain one or more video files (.avi, .mpg) representing a Final Project Presentation and Demonstration. Efforts should be made to combine this into a single file. No more than three files will be reviewed. Refer to the course website for additional information.

Learning Objectives and ABET Outcomes:

Number	Course Learning Objective
1	Learn how to take a project definition, as assigned by a sponsor, and effectively transform it into a to system design
2	Learn how to apply the theoretical solutions of the problem into a physical system that achieves the desired results
3	Learn how to effectively present the theoretical and applied aspects of the project to others in PowerPoint presentation form
4	Learn how to write a technical report that describes the theoretical and applied aspects of a system design
5	Learn how to apply electrical engineering theory and design into a project that is non-electrical engineering in nature
6	Learn how to document research and laboratory work in an ongoing research notebook
7	Learn how to effectively present the theoretical and applied aspects of the project to others in poster presentation form
8	Learn how to work collaboratively in a group with others to solve a technical problem
9	Learn how to design and create a professional printed circuit board
10	Learn how to prototype electrical circuits and test them in the laboratory
11	Learn how to utilize and combine numerous different electrical engineering disciplines to meet the project goals

The EE undergraduate program is accredited by a body known as ABET. ABET has establish a series of outcomes for undergraduate engineering projects (designated as "a" through "k" items). Consideration of these outcomes and how EE4349 contributes to achievement and assessment of them is provided here:

a. an ability to apply knowledge of mathematics, science, and engineering; (VERY WELL COVERED)
b. an ability to design and construct experiments, as well as to analyze and interpret data; (VERY WELL COVERED)
c. an ability to design a system, component, or process to meet desired needs within realistic constraints such as economic, environmental, social, political, ethical, health and safety, manufacturability, and sustainability; (VERY WELL COVERED)
d. an ability to function on multidisciplinary teams; (COVERED OCCASIONALLY)
e. an ability to identify, formulate, and solve engineering problems; (VERY WELL COVERED)
f. an understanding of professional and ethical responsibility; (VERY WELL COVERED)
g. an ability to communicate effectively; (VERY WELL COVERED)
h. the broad education necessary to understand the impact of engineering solutions in a global and societal context; (COVERED)
i. a recognition of the need for, and an ability to engage in lifelong learning; (VERY WELL COVERED)
j. a knowledge of contemporary issues; (BRIEFLY COVERED in SOME CASES)
k. an ability to use the techniques, skills, and modern engineering tools necessary for engineering practice. (VERY WELL COVERED)

Grade of 'Incomplete':

Due to the fact that EE4349 is likely to be taken in what is anticipated to be a student's "final semester", it is generally not desirable nor practical for students to receive a grade of incomplete. Both teams (as a whole) and individual team members must consider the status of their project during the course of the semester and evaluate whether a reasonably acceptable outcome is in grasp.

In questionable cases, either teams or individual students must make determination of whether they wish to submit their work for grading at the end of the semester OR request an incomplete. Submitted work will be graded without any guarantee of receipt of a passing grade – and students should be prepared to consider and accept consequences. Requests for an incomplete must be submitted via email prior to the last regularly scheduled class session. Such requests will only be approved based on consideration of circumstances leading to the request, the amount of remaining work, and an assessment of the probability of completing remaining work in a reasonable (1-2 weeks) period.

Other Important Course Policies and Procedures:

Lab Safety Training:
Students registered for this course must complete the University's required "Lab Safety Training" prior to entering the lab and undertaking any activities. Students should be notified via MavMail when their online training is available. Once notified, students should complete the required module(s) as soon as possible, but no later than their first lab meeting. **There are no exceptions to this requirement. Until all required Lab Safety Training is completed, a student will not be given access to lab facilities, will not be able to participate in any lab activities, and will earn a grade of zero for any uncompleted work.**

Communicating Effectively:
During the course of project execution, there will be much communication (mostly via e-mail) between project members, teams and sponsors, and the course instructor. This document raises key issues and describes guidelines that you should follow to achieve a professional level of communication and good results.

Parts Acquisition:
As of the Fall 2012 semester, new procedures are being implemented for parts acquisition. Please read the following carefully. There are three primary sources for parts to support your project: 1) the EE lab stock, 2) parts purchased from various component distributors (major ones were identified and discussed in EE4340), and 3) special items provided by your sponsor.

The EE lab has a stock of commonly used items that are especially useful for prototyping. These items are listed on a website, along with a parts request form: http://www-ee.uta.edu/eelabs2/

We will attempt to have the parts stockroom open during the class meeting times to get parts for you (This will not be possible for the evening section of the course). You must complete a parts request form and submit it to the instructor via email before any parts will be handed out. The instructor will forward approved requests it to the EE Tech Staff for assistance. They typically get back to me within 48 hours so there will not always be an immediate availability. (We apologize for this limitation, but it is what it is! Think ahead and don't wait till the last minute.) PLEASE, DO NOT GO TO THE TECH STAFF ON YOUR OWN TO GET PARTS. GO THROUGH YOUR INSTRUCTOR!!!!!!!!

Teams may also purchase parts directly. Each team must designate ONE team member as the team purchasing agent. This person will be responsible for submitting receipts for reimbursement and will be the individual who received the reimbursement. Other team members may make purchases, but all such transactions must be handled internally by the team. The team purchasing agent will be allowed to submit a request **at the end of each month** for reimbursement. The total amount requested must be less than $200.00 unless otherwise arranged with the course instructor. Reimbursement of each item for which reimbursement is requested is subject to review and approval of the course instructor. All such items must clearly be project related. Students are encouraged to discuss purchases in advance with the course instructor. Further details will be provided in class.

Some project may require utilization of more costly and specialized items. Individual project sponsors are expected to provide access to such items and agree to do so when their project proposals are submitted.

PCB Layouts:
Where possible all circuits should be laid out as printed circuit boards using EAGLE software. Please consult with the course instructor or the GTA before beginning this. There is a tutorial type file, customized for Senior Design Project considerations, listed on the course website. It is essential that teams developing PCBs utilize the guidelines in this file.

E-mail Topics:
Do not embed too many topics in e-mails; one is best. Especially when you are asking questions of someone, this will delay the response. It is better, for example, to send two separate e-mails than it is to send one e-mail that attempts to address two issues.

Files and File Naming:
Major problems can occur when various documentation files (Word project descriptions, Excel files containing various elements, printed circuit layouts, etc.) are distributed to the various project participants – IF file naming is done without careful thought.

File names should be descriptive. To avoid confusion (and disasters in some cases), they should also consider whether or not there is likely to be a revision of the file by someone at a later time.

Here are some examples of appropriate file names:

Pnn_Final_Report_fv1.doc (fv1 represents "file version 1")
Pnn_Final_Report_ApndxA_fv3.doc
Pnn_Schematic_fv2.sch

Within the document itself (whenever possible), include a statement that clearly describes what the document is – and include a date that indicates when the document was prepared. PLEASE REVIEW and UTILIZE further guidelines provided on the course website.

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. Information about activating and using MavMail is available at:
http://www.uta.edu/oit/cs/email/mavmail.php.

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/ses/fao).

It is noted that dropping EE4349 create consequences for not only the student choosing to drop, but also for their team members. It is therefore essential to consult with the course instructor and keep team members aware of intentions to drop the course.

Americans with Disabilities Act:

The University of Texas at 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). 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 that disability. Any student requiring an accommodation for this course must provide the instructor with official documentation in the form of a letter certified by the staff in the Office for Students with Disabilities, University Hall 102. 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.

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 / graduate catalog. For undergraduate courses, see:
http://wweb.uta.edu/catalog/content/general/academic_regulations.aspx#10

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.

Instructors 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.

The application of this policy to EE 4349 will take two dimensions. The first is that your design must represent the work of your team, and cannot be taken directly from other sources, whether published in book, magazine, or on the internet. The

second is that each team must work independently of all other teams, and may neither receive nor give direct design assistance to a member of another team. When in doubt, please consult the instructor prior to utilizing input that may be of a questionable nature in this regard.

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 www.uta.edu/resources

Title IX:
The University of Texas at Arlington ("University") is committed to maintaining a learning and working environment that is free from discrimination based on sex in accordance with Title IX of the Higher Education Amendments of 1972 (Title IX), which prohibits discrimination on the basis of sex in educational programs or activities; Title VII of the Civil Rights Act of 1964 (Title VII), which prohibits sex discrimination in employment; and the Campus Sexual Violence Elimination Act (SaVE Act). Sexual misconduct is a form of sex discrimination and will not be tolerated. For information regarding Title IX, visit www.uta.edu/titleIX or contact Ms. Jean Hood, Vice President and Title IX Coordinator at (817) 272-7091 or jmhood@uta.edu.

Student Feedback Survey:
At the end of each term, students enrolled in classes categorized as lecture, seminar, or laboratory will be asked to complete an online Student Feedback Survey (SFS) about the course and how it was taught. Instructions on how to access the SFS system will be sent directly to students through MavMail approximately 10 days before the end of the term. UT Arlington's effort to solicit, gather, tabulate, and publish student feedback data is required by state law; student participation in the SFS program is voluntary.

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.

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, which is located on the laboratory door. 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 handicapped individuals.

The IDEAS Center:
(2nd Floor of Central Library) offers **free** tutoring to all students with a focus on transfer students, sophomores, veterans and others undergoing a transition to UT Arlington. To schedule an appointment with a peer tutor or mentor email IDEAS@uta.edu or call (817) 272-6593.

The English Writing Center (411LIBR):
The Writing Center Offers free tutoring in 20-, 40-, or 60-minute face-to-face and online sessions to all UTA students on any phase of their UTA coursework. Our hours are 9 am to 8 pm Mon.-Thurs., 9 am-3 pm Fri. and Noon-6 pm Sat. and Sun. Register and make appointments online at http://uta.mywconline.com. Classroom Visits, workshops, and specialized services for graduate students are also available. Please see www.uta.edu/owl for detailed information on all our programs and services.

The Library's 2nd floor Academic Plaza offers students a central hub of support services, including IDEAS Center, University Advising Services, Transfer UTA and various college/school advising hours. Services are available during the library's hours of operation. http://library.uta.edu/academic-plaza

Librarian to Contact: http://www.uta.edu/library/help/subject-librarians.php

Library: The Library's website address is http://www.uta.edu/library.

The following is a list of commonly used library resources:

Library Home Page	http://www.uta.edu/library
Subject Guides	http://libguides.uta.edu
Subject Librarians	http://www-test.uta.edu/library/help/subject-librarians.php
Database List	http://www-test.uta.edu/library/databases/index.php
Course Reserves	http://pulse.uta.edu/vwebv/enterCourseReserve.do
Library Catalog	http://discover.uta.edu/
E-Journals	http://utalink.uta.edu:9003/UTAlink/az
Library Tutorials	http://www.uta.edu/library/help/tutorials.php
Connecting from Off- Campus	http://libguides.uta.edu/offcampus
Ask a Librarian	http://ask.uta.edu

EE4349 Senior Design Project
Project Expense Reimbursement Request

EE4349 Semester (e.g., F14, SP15): _____ Submit Date: _____

Your Name: _____ Team ID (e.g., P105): _____

Mail Address: _____

_____

_____

Email: _____ Phone: _____

Total Amount Requested (do not include any paid sales tax – see below): _____
(Include on a separate page a summary of receipts, listing date, vendor, and amount. Do not include any paid sales tax in the amount. Include shipping charges if included on the receipt.)

Checklist:
Instructions read and understood? ___ Complete package copied for your records? _____

Number Receipts Attached? _____ Separate Summary Page Attached? _____

INSTRUCTIONS – READ CAREFULLY and FOLLOW

- All requests MUST include a completed version of this form. All information requested MUST be supplied at the time of the initial submission. If any required information is missing, the requested will not be approved and the team will not be reimbursed.
- Only one student from each team can submit this request, which should be submitted at the end of the semester. This should be a person who will have a stable and known mailing address after the semester is completed.
- The limit on reimbursed amount is approximately $200. Do not submit receipts in excess of this amount.
- Receipts:
  - Original and readable receipts or invoices are required.
  - Packing lists are not receipts and will not be accepted. If any packing lists are included, the entire reimbursement request will not be honored.
  - Shipping charges can be reimbursed and should be included in your estimate of the total amount requested.
  - State and city sales tax cannot be reimbursed. Procedures and a link to blank tax exemption certificates are available on the UTA Website (https://www.uta.edu/policy/procedure/4-16). When purchasing something in person, you can provide a completed copy of the certificate to a vendor at checkout. The procedures for doing this is more complex when ordering parts online and different for different vendors. It is often not worth the effort given that the total reimbursement amount will be about $200 and thus total tax on this would be about $16. Consequently, students often choose to pay sales tax and consider it to be a non-reimbursable expense.

Instructor Review and Approval: _____ **Date:** _____

UNIVERSITY OF TEXAS ARLINGTON

Travel

Non Employee Expense Reimbursement

Chartfield: _____ **Supervisor EMPL ID:** _____ **Effective Date:** _____

Purpose of form (Check One): ☐ New Entry ☐ Change Existing **Payment Schedule:** ☐ Onetime Payment ☐ Reoccurring Payment

Reason for Reimbursement/Payment: _____

PART I. PAYEE PROFILE

Legal First Name: _____ **Middle Initial (optional):** _____ **Legal Last Name:** _____ **Suffix (optional):** _____

Social Security Number (SSN) or Individual Taxpayer Identification Number: ☐☐☐-☐☐-☐☐☐☐ **Date of Birth:** _____ **Gender:** ☐ Male ☐ Female **Martial Status:** ☐ Single ☐ Married

Organizational/University Relationship (check one): ☐ Student ☐ Volunteer ☐ Affiliate/Other *(Explain):* _____

Name of Requestor/University of Texas Contact: _____ **Department:** _____

PART II. CITIZENSHIP INFORMATION

Section A. *Citizenship Declaration*

☐ 1 - A citizen or national of the United States of America

☐ 2 - A Lawful Permanent U.S. Resident *Alien/Greencard #:* _____

☐ 3 - A Non U.S. Resident/Non Resident Alien *(If checked, complete section B)*

Section B. *Origin of Citizenship*

Country of Citizenship: _____

Permanent Resident of: _____

Number of days in the U.S. this calender year: ___ Number of days in the USA within the past 12 months: ___

PART III. ADDRESS AND CONTACT INFORMATION

Local Physical Address (US Address)

Address Line 1: _____

Address Line 2: _____

City/Town: _____

State: _____ Zip Code: _____

Area Code & Phone Number: _____

E-mail: _____

Optional: Permanent Home Mailing Address (inside or outside the U.S.)

Address Line 1: _____

Address Line 2: _____

City/Town/ Locality: _____

State/Territory/Providence: _____

Country: _____ Zip Code/Postal Code: _____

Area/Country Code & Phone #: _____

PART IV. DIRECT DEPOSIT PROGRAM

Do you wish to decline direct deposit?.....☐ Yes ☐ No

Decline Direct Deposit Program: *The payee's signature indicates the selection to decline direct deposit of payment reimbursement(s) from the University of Texas.*

Payee's Signature: _____ Date _____

You may be entitled to know what information UT Arlington collects concerning you. You may review and have UT Arlington correct this information according to procedures set forth in UT System Administration UTS139. The law is found in sections 552.021, 552.023 and 559.004 of the Texas Government Code. Disclosure of your Social Security Number (SSN) is required of you in order for the University of Texas at Arlington to help the Texas Controller of Public Accounts administer the state's tax laws and for other purposes, as mandated by Federal and State law. Further disclosure of your SSN is governed by the Public Information Act (Chapter 552 of the Texas Government Code) and other applicable law.

MODIFICATION TO THIS FORM IS STRICTLY PROHIBITED.

Direct Deposit Authorization

Notification: *Request must allow for sufficient time for processing and may not be effective for the next check run. Late requests may result in a check being issued or Direct Deposit to an established account. We strongly suggest leaving your old account open until the deposit into your new account has occurred.*

A. Action Type *(Select only one Action Type)*

- ☐ New Direct Deposit Setup
- ☐ Change Current Direct Deposit: Change Account or Financial Institution
- ☐ Cancel Direct Deposit

B. Financial Institution Information *(Completion by financial institution is recommended)*

Account Type: ☐ Checking ☐ Savings

Financial Institution Name: _____

Routing Number (*9-Digits*): _____

Account Number (*max 17 characters*): _____

C. Financial Representative

Financial Representative Name *(optional)*: _____ Title (*optional*): _____

Phone Number*(optional)*: _____ ext. _____ E-Mail: _____

Financial Representative Signature (optional): _____ Date*(optional)*: _____

D. International Payment Verification (required)

The National Automated Clearing House Association (NACHA) adopted specific rules regarding International ACH Transactions (IAT). NACHA requires entities originating ACH (Direct Deposit) payments to comply with IAT rules and federal law. To comply, payees are required to identify the intended final destination of payments issued through the ACH network.

Will payment(s) be forwarded to a financial institution outside the United States?..... ☐ YES ☐ NO

If Yes, Please specify the name of the country where payment(s) will be forwarded: _____

E. Direct Deposit Authorization Agreement

Authorization Agreement: *I hereby authorize the University of Texas to deposit my payments directly to the account listed above (Section B) by way of Direct Deposit (Automated Clearing House (ACH) credit). This authority will remain in force until I have given advanced written notice, or deposit service has been discontinued by the discretion of the University of Texas. I understand that I must provide advance notice to allow reasonable time for my instructions to be executed. I understand that it is my sole responsibility to verify with my financial institution the receipt of my direct deposit funds. I agree to notify the University of Texas within three (3) business days if the deposit has not been made and/or receipt of an incorrect deposit amount Furthermore, if an incorrect deposit should be made into my account, I authorize my financial institution and the University of Texas to make appropriate adjustment(s) from my account.*

Authorized Signature (required): _____

Printed Name (required): _____ Date (required): _____

Optional*: A copy of a voided check or Printed Bank Account Information Page for Checking or Account Card Copy for Savings Direct Deposit may be attached.*

You may be entitled to know what information UT Arlington collects concerning you. You may review and have UT Arlington correct this information according to procedures set forth in UT System Administration UTS139. The law is found in sections 552.021, 552.023 and 559.004 of the Texas Government Code. Disclosure of your Social Security Number (SSN) is required of you in order for the University of Texas at Arlington to help the Texas Controller of Public Accounts administer the state's tax laws and for other purposes, as mandated by Federal and State law. Further disclosure of your SSN is governed by the Public Information Act (Chapter 552 of the Texas Government Code) and other applicable law.

MODIFICATION TO THIS FORM IS STRICTLY PROHIBITED.

'MUST HAVES' FOR SENIOR DESIGN REIMBURSEMENTS ---

Name of student collecting all receipts
That student's UTA ID
That student's email address
Course number and section, semester/year, project number
Instructor

SENIOR DESIGN PROJECT LIST OF RECEIPTS (sample attached) listing all of his/her receipts
IN DATE ORDER FROM EARLIEST TO CURRENT
MUST list date of purchase - place of purchase - subtotal of purchase (items cost less tax) - if shipping charges, list separate - grand total
Once all receipts are listed, they must be totaled and that total must be written at the bottom of the form. **ACTUAL RECEIPT TOTALS AND LIST TOTALS** MUST MATCH

EXAMPLE:

Date of Purchase	Where purchased	Subtotal	Shipping	Total
2/25/16	Tayda Electronics	$ 9.99	$1.75	$11.74
3/1/16	Lowe's	$25.00		$25.00
3/3/16	Home Depot	$12.17		$12.17

ALL RECEIPTS MUST SHOW PROOF OF PAYMENT
NO ORDER CONFIRMATIONS, NO INVOICES, NO 'NOT YET SHIPPED'
NO receipts will be accepted that do not show how payment was made
PROOF OF PAYMENT may be a receipt showing a $0 balance due; a receipt showing credit card information – card type, total purchase amount and date paid; or a copy of the student's credit card statement showing date, where purchased and dollar amount of charge. For Mouser the one that shows Credit Card Receipt in the top right is the accepted receipt. The 'order confirmation' won't work. If purchased with PayPal, the PayPal transaction page must be included.

ALL RECEIPTS such as Lowe's, Home Depot, Ace Hardware, etc. **MUST BE TAPED to 8 ½ x 11 sheets of paper**
Tape MUST NOT COVER place of purchase, date of purchase, money amounts.
If long receipt, cut so that all of the receipt will fit and be able to be taped to the sheet, DO NOT fold under and tape

UTA TRAVEL/EXPENSE VOUCHER COVER SHEET (sample attached) **signed and dated by student**
Student should complete Traveler/Payee signature line and date and Printed Traveler/Payee Name --- the rest will be filled in at the time the Expense Report is processed.

IF ANY OF THE ABOVE ITEMS ARE MISSING, THE ENTIRE REQUEST FOR REIMBURSEMENT WILL BE SET ASIDE AND NOT PROCESSED. THE PACKET MUST BE COMPLETE AT THE TIME IT IS SUBMITTED.

SENIOR DESIGN PROJECT LIST OF RECEIPTS

Date _____ Semester: SPRING 20____ FALL 20____ Project Number _____

Course Number/Section _____ Instructor _____

Student Name _____ UTA ID _____

Student email _____

LIST OF RECEIPTS IN DATE ORDER – EARLIEST TO MOST RECENT

Date of Purchase	Where Purchased	Subtotal (cost less tax)	Shipping Charges	Total

TRAVEL/NON-TRAVEL EXPENSE COVER SHEET

Please check one: ☐ Travel ☐ Non-Travel

Please check one: ☐ Employee ☐ Non-Employee

Expense Report ID: _____ **Cost Center/Project:** _____ **Amt:** _____

Dates of Travel: _____

I certify that the expenses are true, correct and have not been submitted for reimbursement or payment on any other form or claim. I acknowledge this expense is subject to post payment review. In the event I am overpaid, I will refund the overpayment to the University.

Traveler/Payee Signature: _____ **Date:** _____

Printed Traveler/Payee Name: _____

Dept. Approver Signature: _____ **Date:** _____

Printed Approver Name: _____

ELECTRICAL ENGINEERING
SENIOR DESIGN STUDENT RECEIPT APPROVAL

This form must be signed by your Senior Design instructor and turned in with your mid-semester receipts for reimbursement of project-related expenses from University funds. Keep in mind that UTA will not reimburse sales tax.

Check the one below that applies:

EE 4349-001 _____ Semester _____ Year _____
EE 4349-002 _____

Complete the following:

Instructor _____ Project Number _____

Your name _____ UTA ID _____

Your email address _____

Signature of faculty member approving receipts

_____ Date _____