Syllabus for ECE 420, Senior Design II: Spring 2020

1. Course number and name: ECE 420, Senior Design II

2. Credits and contact hours
   Three (3) credit hours: classroom time will average less than 1 hour per week; primary effort is on work (approx. 8 – 10 hours/week) on sponsored projects.

3. Instructors and TA names
   Lead Instructor - Ramiro Jordan
   Assistant Instructor – Ganesh Balakrishnan
   Teaching Assistant – Bradley Evans

4. Addition information: Ramiro Jordan
   a. Office Location: ECE 125D
   b. Office Hours: To be coordinated via email or other means.
   c. Class Meeting Day(s): TUE and THU, 14:00 – 15:15
   d. Class Location / Room: MECH 218
   e. Email: rjordan@unm.edu
   f. Office Phone: (505) 277-2412
   g. Term / Semester: Spring 2020
   h. Final Exam date: NA

5. Addition information: Ganesh Balakrishnan
   a. Office Location: CHTM 116B
   b. Office Hours: To be coordinated via email or other means.
   c. Class Meeting Day(s): TUE and THU, 14:00 – 15:15
   d. Class Location / Room: MECH 218
   e. Email: gunny@unm.edu
   f. Office Phone: 272-7970
   g. Term / Semester: Spring 2020
   h. Final Exam date: NA

6. Addition information: Bradley Evans
   a. Office Location: ECE 327E
   b. Office Hours: To be coordinated via email or other means.
   c. Class Meeting Day(s): TUE and THU, 14:00 – 15:15
   d. Class Location / Room: MECH 218
   e. Email: bradleyevans@unm.edu
   f. Term / Semester: Spring 2020
   g. Final Exam date: NA

7. Text book, title, author, and year
   No textbook is required for this class. Links to web sites plus documents posted on learn.unm.edu will be used.
8. **Course Catalog Information**  
Continuation of ECE 419. Students will work in assigned teams to implement proposal developed in ECE 419. Prototypes are built and tested to sponsor specifications, and oral and written reports are made to the project sponsor.

9. **Restrictions**  
Students should be ECE majors and have senior standing.

10. **Expanded Course Description**  
In most of your courses so far, you have focused on learning theory and technical skills, such as hardware and computer programming. As you develop your capabilities, the next challenge is to apply them to projects in an effective manner. The objective of this course is to teach you additional skills and give you practice in applying all that you have learned towards solving real-world problems and raise your awareness of global issues.

In recent years, most engineering schools have adopted capstone courses to prepare students for the transition from student to working engineers. This type of courses has tremendous value as the skills that you learn will be valuable throughout your career as you are entering Industry 4.0 challenges.

Much of ECE 419/420 consists of the team implementation of a sponsor-accepted proposal culminating in an oral presentation, product demonstration, and formal report. Topics include architecture and design of a project targeted towards the sponsor’s goals and needs, followed by implementation, testing, project management, and documentation. Another key component of ECE 419/420 is Ethics in Engineering (which used to be a separate 1-credit course, ECE 409 in previous years). Finally, there is an Entrance Knowledge Probe in ECE 419 and an Exit Knowledge Probe that are used for ABET Program Outcomes Assessment.

11. **Course Objectives**  
Development and successful completion of a sponsored development project. Specific objectives include the development of effective project management, communication, and technical skills, experience with the implementation and testing phases of a realistic product design cycle, and an ordered transition from a classroom-oriented academic environment to a performance-oriented professional environment. You will have to learn to:
   o Properly define and scope a problem;
   o Identify and analyze relevant factors;
   o Apply appropriate industrial engineering methodologies and computational tools;
   o Generate and evaluate alternative solutions; and
   o Improve your skills in
     o Technical writing,
12. Engineering Ethics
The Engineering Ethics section of this class will introduce students to modern-day aspects of engineering professions. Goals for the engineering ethics portion of the class are:

- To understand what a profession is and to understand the professional nature of engineering.
- To understand what a code of ethics is and how it can be used.
- To understand the theoretical underpinnings of professional ethics.
- To learn how to apply ethical problem-solving tools to real and hypothetical ethical problems.
- To be sensitized to the potential ethical issues involved in engineering practice.

13. WEBSITE learn.unm.edu and DROPBOX
All assignments, exams, deliverables and rubrics are found on learn.unm.edu. Most importantly, **the Semester Schedule is the master schedule for the class and always is the latest and most correct reference regarding class meetings, deliverables and deadlines.** Follow it exactly and **CHECK IT OFTEN!!**

**Most, if not all team assignments, will be submitted via DropBox.** Keep a relevant assignments folder in your DropBox folder, so that the instructors may peruse this file for submitted assignments. You may update your assignments frequently, but do not remove old submissions from your Dropbox folder.
14. **Grading**  
Grades are calculated using the following grading rubric:

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<tr>
<th>Grade Weighting</th>
<th>Weight</th>
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<tbody>
<tr>
<td>Tech Part II - Test Plan</td>
<td>10%</td>
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<td>Tech Part III - Characterization Report</td>
<td>10%</td>
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<tr>
<td>Final Report</td>
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<td>Posters &amp; Poster Session (Expo)</td>
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<tr>
<td>Knowledge Probe</td>
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<tr>
<td>Faculty Panels</td>
<td>20%</td>
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<td>Team Members’ Performance Appraisal (by PM)</td>
<td>5%</td>
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<td>Sponsor’s Appraisals</td>
<td>15%</td>
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<tr>
<td>Technical Paper &amp; Review by Instructors (includes attendance)</td>
<td>15%</td>
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<td>Extra Credit (based on class participation and unusual performance)</td>
<td>10%</td>
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<tr>
<th>GRADING SCALE</th>
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<tr>
<td>Percentage</td>
<td>Grade</td>
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<tr>
<td>&gt; 100%</td>
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<td>92.99%-100%</td>
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<td>90-92.99%</td>
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<td>87-89.99%</td>
<td>B+</td>
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<td>83-86.99%</td>
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<td>80-82.99%</td>
<td>B-</td>
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<td>77-79.99%</td>
<td>C+</td>
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<td>73-76.99%</td>
<td>C</td>
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<tr>
<td>&lt; 73.00%</td>
<td>Doesn't Earn Credit in SOE</td>
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**IMPORTANT GRADING NOTE**  
If due to your non-performance your Sponsor requests in writing that you be dropped from the project team, you may be dropped from Senior Design if in the judgment of the ECE Department, it is too late to assign you to a different project.
Other Grading Information

1. Team documents returned as unsatisfactory will be counted as non-existing.
2. All deadlines must be met (or revised -- with justification). If a document is received by the instructor after the established deadline, a 10% penalty/day will be imposed.
3. Peer evaluation: Each team member (and the PM) will occasionally rate the performance of fellow team members in writing. If you do not submit a timely peer evaluation for other members of your team, your peer evaluation score will be -3.3%.
4. Peer and Sponsor Evaluations are typically confidential so you may not know every single grade entry for the semester.
5. Your attendance during class time (lecture, oral progress reports, and Team Work Days) is mandatory. You will be allowed a total of two excused absences from class. Excused absences from class require written my permission in advance. For each unexcused absence, there will be a 1.65% deduction from your semester grade.
6. The following is not permitted in class: Laptop/tablet usage (unless for note-taking, cleared with me in advance), texting, Facebook, YouTube, Sudoku, crosswords, Daily Lobo, etc. We will reduce your semester grade if you have to be warned more than once.
7. This class considers performance elements other than exams and homework, and these cannot be easily quantified. Judgment of the Instructor is final. Attendance at announced class meetings and guest lectures is mandatory, unless written permission for such an absence is obtained in advance from one of the class instructors.

15. Electronic Files, Reports, Quizzes and Exams, Directories and Email for Students

- The electronic file format accepted for students to submit Reports, Quizzes and Exams is PDF.
- Naming convention: name-lastname-quiznumber.pdf
- Teamwork: use all the last names followed by report, quiz or exam number
- If you have more than one file, then create a directory with all your files and compress it before your email. Naming convention: name-lastname-reportnumber.zip
- All emails to the instructors must have the tag ece420 in the subject field
- All emails will be sent to your UNM account. If you want to forward to another email system, then you are responsible for making sure you receive and send emails.
- Each project team will be given a DROPBOX directory to keep all materials required for the class. The account will be managed by each Program Manager.
16. Attendance Policy
Regular and punctual attendance is required. UNM Pathfinder policies apply, which in part means instructor drops based on non-attendance are possible. This policy applies regardless of the grading option you have chosen.

17. Special Circumstances
The instructor should be notified as early as possible regarding any special conditions or circumstances which may affect a student’s performance during the course timeframe (e.g., medical emergencies, family circumstances, etc).

18. Academic Integrity: Dishonesty in Academic Matters
Each student is expected to maintain the highest standards of honesty and integrity in academic and professional matters. The university reserves the right to take disciplinary action, including dismissal, against any student who is found responsible for academic dishonesty or who otherwise fails to meet the standards. Any student who has been judged to have engaged in academic dishonesty in course work may receive a reduced or failing grade for the work in question and/or for the course.

Academic dishonesty includes, but is not limited to, dishonesty in quizzes, tests, or assignments (including programming assignments); claiming credit for work not done or done by others; hindering the academic work of other students; misrepresenting academic or professional qualifications within or outside the university; and nondisclosure or misrepresentation in filling out applications or other university records.

The University of New Mexico believes that academic honesty is a foundation principle for personal and academic development. All University policies regarding academic honesty apply to this course. Academic dishonesty includes, but is not limited to, cheating or copying, plagiarism (claiming credit for the words or works of another from any type of source such as print, Internet or electronic database, or failing to cite the source), fabricating information or citations, facilitating acts of academic dishonesty by others, having unauthorized possession of examinations, submitting work of another person or work previously used without informing the instructor, or tampering with the academic work of other students. The University's full statement on academic honesty and the consequences for failure to comply is available in the college catalog and in the Pathfinder.

19. Calculators
The use of basic electronic calculators is generally permitted on tests.

20. A few words on pagers and cell phones
A classroom is a learning environment. A ringing cell phone or beeping pager going off during a lecture is disruptive to other students as well as the instructor.
If you must bring a beeper or cell phone to class, set it to vibrate (not ring) and leave the classroom discretely to answer your phone or to return the page. If you cannot set your phone or pager to vibrate, turn it off during class! If your cell phone or pager rings during lecture, you will be asked to leave. Turn your cell phone or pager off during exams and quizzes!! If you answer your phone or leave the room for any reason during an exam or quiz, you will not be allowed to finish!

As a matter of courtesy, please turn off cell phones, pagers, and other communication and entertainment devices prior to the beginning of class. Notify me in advance if you are monitoring an emergency, for which cell phone ringers should be switched to vibrate.

21. Reasonable Accommodation
The university makes reasonable accommodation to the religious observances/national origin practices of a student and to the known physical or mental limitations of a qualified student or program user with a disability, unless such accommodations have the end result of fundamentally altering a program or service or placing an undue hardship on the operation of the university. Qualified students or program users with disabilities should contact the Office of Equal Opportunity or the Student Support Services for information regarding accommodations. The University of New Mexico is committed to the recognition and the proactive pursuit of compliance with the Americans with Disabilities Act of 1990 (ADA).

Accessibility Services (Mesa Vista Hall 2021, 277-3506) provides academic support to students who have disabilities. If you think you need alternative accessible formats for undertaking and completing coursework, you should contact this service right away to assure your needs are met in a timely manner. If you need local assistance in contacting Accessibility Services, see the Bachelor and Graduate Programs office.

22. Library and Tutorial Services Click here to enter text.
UNM-Main campus provides many library services and some tutorial services for distance students. For library services, go to http://www.unm.edu/libraries/ to link to a specific library or to contact a librarian. For tutorial services, go to http://caps.unm.edu/online to explore UNM’s online services.
23. Specific NEW ABET goals for this course (ECE420)

**ABET Program Outcomes Probed: 1-7, as required by ABET (see below)**

**ABET Program Outcomes:** Engineering programs must demonstrate that their students attain the following outcomes

1. an ability to identify, formulate, and solve complex engineering problems by applying principles of engineering, science, and mathematics
2. an ability to apply engineering design to produce solutions that meet specified needs with consideration of public health, safety, and welfare, as well as global, cultural, social, environmental, and economic factors
3. an ability to communicate effectively with a range of audiences
4. an ability to recognize ethical and professional responsibilities in engineering situations and make informed judgments, which must consider the impact of engineering solutions in global, economic, environmental, and societal contexts
5. an ability to function effectively on a team whose members together provide leadership, create a collaborative and inclusive environment, establish goals, plan tasks, and meet objectives
6. an ability to develop and conduct appropriate experimentation, analyze and interpret data, and use engineering judgment to draw conclusions
7. an ability to acquire and apply new knowledge as needed, using appropriate learning strategies.

24. **Citizenship and/or Immigration Status:** All students are welcome in this class regardless of citizenship, residency, or immigration status. Your professor will respect your privacy if you choose to disclose your status. As for all students in the class, family emergency-related absences are normally excused with reasonable notice to the professor, as noted in the attendance guidelines above. UNM as an institution has made a core commitment to the success of all our students, including members of our undocumented community. The UNM Administration’s welcome is found on our website: http://undocumented.unm.edu/.

25. **UNM Copyright Policy and Law**

*From University Counsel's Office, Subject to Change Without Notice*

The unauthorized distribution of copyrighted material, including through peer-to-peer file sharing, may subject a student to criminal and civil penalties. The laws that govern copyright are not specific to any one technology. Students can violate the rights of a copyright holder using many different types of technology. Both uploading
and downloading of files can pose a violation of the copyright law. Students should be cautious when obtaining any copyrighted material. As a rule of thumb, before a student receives anything for free, they should research whether that source provides material licensed by the copyright owner. A group called EDUCAUSE has a list of legal file sharing alternatives at [http://www.educause.edu/legalcontent](http://www.educause.edu/legalcontent).

Individuals who violate copyright law by illegally uploading and downloading copyrighted files may be subject to civil penalties of between $750 and $150,000 per song. These penalties are established by federal law. In the past, pre-litigation settlements offered by copyright owners have been in the $3,000 to $4,000 and up range while juries in some jurisdictions have issued verdicts of hundreds of thousands and up. In addition, a court may, in its discretion, grant the copyright owner reasonable attorney fees. Although criminal prosecution of students for file sharing is extremely rare, federal law lays out criminal penalties for intentional copyright infringement which can include fines and jail time. In addition to potentially violating the law, unauthorized distribution or receipt of copyrighted material is a violation of University Business Policies and Procedures Manual 2500. That policy states that: “Users shall respect all copyrights including software copyrights...Use of University computing services in violation of applicable laws or University policy may result in sanctions, including withdrawal of use privilege; disciplinary action, up to and including, expulsion from the University or discharge from a position; and legal prosecution under applicable federal and/or state law.”