1. **Catalog Description:** Design and verification of embedded systems including system level modeling and specification, design space exploration, hardware-software partitioning, real-time operating systems, hardware/software components and system architecture, functional validation, and optimization techniques to improve area, power, performance, security and reliability of embedded systems.

2. **Prerequisites:** CDA 3101 (Computer Organization) and any one programming course (CGS 2414, CGS 3460, CGS 3464 or equivalent).

3. **Course Objectives:** Embedded systems run the computing devices hidden inside a vast array of everyday products and appliances such as cell phones, toys, handheld PDAs, cameras, and microwave ovens. Cars are full of them, as are airplanes, satellites, and advanced military and medical systems. As applications grow increasingly complex, so do the complexities of the embedded computing devices. The goal of this course is to develop a comprehensive understanding of the technologies behind the embedded systems design. The students will develop an appreciation of the existing capabilities and limitations of various steps in overall design methodology including system-level modeling and specification, design space exploration, hardware-software partitioning, real-time operating systems, hardware/software components, functional validation, and optimization to improve area, power, performance, security and reliability of embedded systems.

4. **Contribution of course to meeting the professional component:** Not applicable.

5. **Relationship of course to program outcomes:** a, c, e, k

6. **Instructor:** Dr. Prabhat Mishra  CSE E568  (352) 505 1880  prabhat@cise.ufl.edu  
Office Hours: Wednesday 1:55 – 3:50 PM or by appointment.

7. **Teaching Assistant:** TBA  
Office Hours: TBA

8. **Meeting Times:** Monday, Wednesday and Friday at Period 4 (10:40-11:30)

9. **Class/laboratory schedule:** See class meeting times above.

10. **Meeting Location:** CSE 107

11. **Material and Supply Fees:** Not applicable

12. **Textbooks and Software Required:** None

13. **Recommended Reading:** The course will cover materials from various books and journal articles. A sample list of references is included below:
14. **Course Outline:** The following topics will be covered.

- Introduction and Motivation
- Modeling and Specification
- Embedded Systems Architecture
- Real-Time Scheduling and Operating Systems
- Hardware-Software Co-Design
- Compilation of Embedded Applications
- Control Systems
- Lossless Compression
- Design Space Exploration
- Validation and Verification
- Dynamic Reconfiguration in Real-Time Systems

15. **Attendance and Expectations:** I encourage students to attend all the lectures and actively participate in class discussions.

- **Cell Phones:** Please turn your cell phone off before you come to class.
- **Regrading Policy:** Regrading request should be made within a week from the date the graded item (exam, project, or homework) is available.

16. **Grading – methods of evaluation:** The grading is based on the following components.

1. Homeworks (2): 20%
   - Homework 1: 10%
   - Homework 2: 10%

2. Exams (closed book/notes, no make-up exams): 60%
   - Midterm: 25%
   - Comprehensive Final: 35%

3. Projects (2): 20%
   - Project 1: 10%
   - Project 2: 10%

Homeworks and projects should be submitted using e-Learning before the deadline. Grading will be based on what you explicitly stated in your answers of your homework, exam, or project. Please try to be as clear and precise as possible.

17. **Grading Scale:** The final grade will be on the curve based on the overall score. Typically top 20-30% students receive A, next 20-30% receives A-, and so on.

   A C- will not be a qualifying grade for critical tracking courses. In order to graduate, students must have an overall GPA and an upper-division GPA of 2.0 or better (C or better). **Note:** a C- average is equivalent to a GPA of 1.67, and therefore, it does not satisfy this graduation requirement. For more information on grades and grading policies, please visit:

   [https://catalog.ufl.edu/ugrad/current/regulations/info/grades.aspx](https://catalog.ufl.edu/ugrad/current/regulations/info/grades.aspx)
18. Requirements for class attendance and make-up exams, assignments, and other work are consistent with university policies that can be found at the following website. No make-up exams except for medical emergencies with supporting documents or when permitted by university policies. 
https://catalog.ufl.edu/ugrad/current/regulations/info/attendance.aspx

19. Honesty Policy – UF students are bound by The Honor Pledge which states, “We, the members of the University of Florida community, pledge to hold ourselves and our peers to the highest standards of honor and integrity by abiding by the Honor Code. On all work submitted for credit by students at the University of Florida, the following pledge is either required or implied: “On my honor, I have neither given nor received unauthorized aid in doing this assignment.” The Honor Code (http://www.dso.ufl.edu/sscr/process/student-conduct-honor-code/) specifies a number of behaviors that are in violation of this code and the possible sanctions. Furthermore, you are obligated to report any condition that facilitates academic misconduct to appropriate personnel. If you have any questions or concerns, please consult with the instructor or TAs in this class.

Note that failure to comply with this commitment will result in disciplinary action compliant with the UF Student Honor Code Procedures. See http://www.dso.ufl.edu/sscr/procedures/honorcode.php

20. Accommodation for Students with Disabilities – Students Requesting classroom accommodation must first register with the Dean of Students Office. That office will provide the student with documentation that he/she must provide to the course instructor when requesting accommodation.

21. UF Counseling Services – Resources are available on-campus for students having personal problems or lacking clear career and academic goals. The resources include:

- Career Resource Center, Reitz Union, 392-1601, career and job search services.
- University Police Department 392-1111

22. Software Use – All faculty, staff and student of the University are required and expected to obey the laws and legal agreements governing software use. Failure to do so can lead to monetary damages and/or criminal penalties for the individual violator. Because such violations are also against University policies and rules, disciplinary action will be taken as appropriate. We, the members of the University of Florida community, pledge to uphold ourselves and our peers to the highest standards of honesty and integrity.

23. Students are expected to provide feedback on the quality of instruction in this course based on 10 criteria. These evaluations are conducted online at https://evaluations.ufl.edu. Evaluations are typically open during the last two or three weeks of the semester, but students will be given specific times when they are open. Summary results of these assessments are available to students at https://evaluations.ufl.edu/results.”