1. **Course number and name**  
   ENGR 844: Embedded Systems

2. **Credits and contact hours**  
   3 credit hours; one 2-hour-45-minute lecture sessions/week

3. **Instructor’s or course coordinator’s name**  
   Instructor: Hamid Mahmoodi, Assistant Professor of Computer Engineering  
   Course coordinator: Hamid Mahmoodi, Assistant Professor of Computer Engineering

4. **Text book, title, author, and year**  

   a. **other supplemental materials**  
      Lecture notes

5. **Specific course information**  
   a. **brief description of the content of the course (catalog description)**  
      Trends and challenges of embedded systems. Introduction of design and use of single-purpose processors (hardware) and general-purpose processors (software). Discussion of memories and buses, advanced computation models, control systems, chip technologies, and modern design tools.

   b. **prerequisites or co-requisites**  
      ENGR 356 or equivalent

   c. **indicate whether a required, elective, or selected elective course in the program**  
      Elective

6. **Specific goals for the course**  
   a. **specific outcomes of instruction, ex. The student will be able to explain the significance of current research about a particular topic.**  
      - The student will be able to perform hardware and software partitioning of an embedded design
      - The student will be able to explain the difference between custom single purpose processors and general purpose processors
      - The student will be able to describe memory technologies
      - The student will be familiar with video and image standards in embedded systems
      - The student will be able to perform interfacing of different components in an embedded system
      - The student will be able to describe different IC implementation technologies
      - The student will be able to design embedded systems in an advanced programmable chip technology platform (FPGA)
b. explicitly indicate which of the student outcomes listed in Criterion 3 or any other outcomes are addressed by the course.
   Course addresses ABET Student Outcome(s): a, b, c, d, e, g, i, j, k.

7. Brief list of topics to be covered

- Introduction to embedded systems
- Custom single-purpose processors: Hardware
- General-purpose processors: Software
- Standard single-purpose processors: Peripherals
- Memory
- Interfacing
- Digital Camera Example
- State machine and concurrent process models
- Control Systems
- IC technologies
- Design technology