1. **Course number and name**  
   ENGR 315: Systems Analysis Laboratory

2. **Credits and contact hours**  
   1 credit hours; one 2-hr-45-minute laboratory session/week

3. **Instructor’s or course coordinator’s name**  
   Instructor: Tom Holton, Instructor  
   Course coordinator: Tom Holton, Professor of Electrical and Computer Engineering

4. **Text book, title, author, and year**  
   none

   a. **Other supplemental materials**  
      Holton, T. ENGR 315 Website. All laboratory exercises and pre-lab information is available online at [http://www.sfsu.edu/~ee/315](http://www.sfsu.edu/~ee/315). The username and password are given at the first lecture.

5. **Specific course information**  
   a. **Brief description of the content of the course (catalog description)**  

   b. **Prerequisites or co-requisites**  
      ENGR 305: Systems Analysis (may be taken concurrently).

   c. **Indicate whether a required, elective, or selected elective course in the program**  
      Required for Electrical Engineering

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.**  
      - Students will demonstrate the ability to use Matlab to plot signals in the continuous-time domain.
      - Students will demonstrate the ability to use Matlab to verify theoretical solution of linear differential equations in response to impulse and step inputs.
      - Students will demonstrate ability to use Matlab to plot convolution of two functions.
      - Students will demonstrate the ability to use Matlab to determine and plot Fourier series and Fourier transform of functions.
      - Students will demonstrate the ability to use Matlab to determine and plot Laplace transforms and inverse transforms.
      - Students will demonstrate the ability to use Matlab to determine the system function, Bode plots and pole-zero plots.
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, e, k.

7. Brief list of topics to be covered
   • Introduction to Matlab
   • Introduction to basic concepts of signals and systems.
   • Characterization of continuous-time signals.
   • Linearity and time invariance.
   • Time-domain solutions of differential equations.
   • Fourier series and Fourier transform methods.
   • Applications of Fourier transforms: sampling theorem, modulation
   • Laplace transform