1. *Course number and name*
   ENGR 121: Gateway to Computer Engineering

2. *Credits and contact hours*
   1 credit
   Contact hours: 100-minute lab session/week

3. *Instructor's or course coordinator's name*
   Instructor: Poornima Kallalli Eshwara
   Course coordinator: Xiaorong Zhang, Assistant Professor of Computer Engineering

4. *Text book, title, author, and year*
   "Robotics with the Boe-Bot Student Guide Version 3.0", Parallax, 2012
   a. *other supplemental materials*
   Lab material:
   Boe-Bot Robot Kit -USB Version (item code 28832)
   http://www.parallax.com/Store/Robots/AllRobots/tabid/128/CategoryID/3/List/0/SortField/0/Level/a/ProductID/296/Default.aspx

5. *Specific course information*
   a. *brief description of the content of the course (catalog description)*
   - Introduction to embedded computer systems and microcontrollers
   - Basic laboratory instrumentation, electronic circuit assembly, measurement, and testing.
   - Hands-on introduction to microcontroller programming and robotic design.

   b. *prerequisites or co-requisites*
   High school algebra and trigonometry

   c. *indicate whether a required, elective, or selected elective course in the program*
   Required for Computer 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 completing the course successfully will
   - demonstrate a basic understanding of computer systems, including both hardware and software and their interactions with each other.
   - demonstrate the abilities to define and describe basic electrical terms, and construct simple electronic circuits from a schematic.
   - demonstrate the abilities to describe types of sensing and control devices.
   - acquire hands-on experience working with electronic components and robot programming.

- be aware of the importance of "soft" skills needed to succeed academically and professionally, including study skills, time management skills, stress management skills, communication skills, problem solving skills, and team work skills.

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, e, g, k.

7. *Brief list of topics to be covered*
- Electronic components and assembling
- Boe-Bot Chapter 1: Your Boe-Bot's Brain
- Boe-Bot Chapter 2: Your Boe-Bot's Servo Motors
- Boe-Bot Chapter 3: Assemble and Test Your Boe-Bot
- Boe-Bot Chapter 4: Boe-Bot Navigation
- Challenge 1: Navigating a fixed course
- Boe-Bot Chapter 5: Tactile Navigation with Whiskers
- Challenge 2: Tactile Navigation
- Boe-Bot Chapter 6: Light Sensitive Navigation with Phototransistors
- Challenge 3: Light-Sensing Navigation,
- Boe-Bot Chapter 7: Navigating with Infrared Headlights
- Boe-Bot Chapter 8: Robot Control with Distance Detection
- Challenge 4: Maze Navigation