1. *Course number and name*

**ENGR 301: Electrical Measurement**

1. *Credits and contact hours*

1 credit hours

1. *Instructor’s or course coordinator’s name*

Instructor: Jianbin Huang

Course coordinator: Hao Jiang, Professor

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

Franco, Sergio, and Klingenberg, Larry J. *Lab Manual for ENGR 301*

1. *Specific course information*

*a. brief description of the content of the course (catalog description)*

Measurement techniques, device characterization, experimental verification, and Spice simulation. 2nd-order transient and frequency responses. Characterization of diodes, BJTs and FETs. Diode circuits, transistor amplifiers.

*b. prerequisites or co-requisites*

ENGR 353 (Electronics) (can be taken concurrently)

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

Required for Electrical Engineering and Computer Engineering

1. *Specific goals for the course*
2. *Specific outcomes of instruction, ex. The student will be able to explain the significance of current research about a particular topic.*

* To measure the characteristics of common electronic devices such as diodes, BJTs, FETs, and to compare with theoretical prediction.
* To observe experimentally the behavior of the aforementioned devices in a variety of common applications, such as rectification, regulation, amplification, and to compare with theoretical prediction.
* To simulate the aforementioned circuits via Spice, and to compare with experimental observations.
* To plot, analyze, and interpret data, and to prepare technical reports of appropriate quality.

1. *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): 1, 3, 5, 6, 7

1. *Brief list of topics to be covered*

* Second-order step responses under various damping conditions; frequency responses, Bode Plots.
* Diode characteristics, and basic diode applications as rectifiers and regulators.
* Transistor (BJT and MOSFET) characteristics, and basic transistor applications as amplifiers and logic circuits.
* Computer simulation of diodes and transistor circuits using Spice; comparison with experimental observations.