Template for ABET course syllabi (new format)

1. Course number and name
   ENGR 456  Computer Systems

2. Credits and contact hours
   3 Credits.

3. Instructor’s or course coordinator’s name
   Instructor: Hamid Shahnasser, Ph.D
   Course coordinator: Hamid Shahnasser, Ph.D

4. Text book, title, author, and year
   a. other supplemental materials
      Not Mentioned

5. Specific course information
   a. brief description of the content of the course (catalog description)
   b. prerequisites or co-requisites
      A grade of C or better in ENGR 356
   c. indicate whether a required, elective, or selected elective course in the program
      Required for Computer Engineering , Elective 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.
      - The student will demonstrate knowledge of the overall structure of a computing system.
      - The student will demonstrate an ability to design arithmetic circuits.
      - The student will demonstrate knowledge of simple and pipelined datapaths
      - The student will demonstrate knowledge of hardwired and microprogrammed control.
      - The student will demonstrate knowledge of memory hierarchy and its operations.
      - The student will demonstrate a good understanding of the MIPS2000 processor.
      - The student will demonstrate fundamental knowledge of the PowerPC processor. The student will demonstrate fundamental knowledge of the
80X86/ Pentium processor.
- The student will demonstrate an ability to compare performance measurements.
- The student will demonstrate knowledge of instruction formats and addressing modes.
- The student will demonstrate knowledge of the basic concepts in assembly language programming.

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,c,e.

7. Brief list of topics to be covered
- Historical perspective of computing
- Basic 5-block computer structure
- Matrix and Performance measurement
- Instruction sets, instruction format, and addressing methods
- Assembly language programming and instruction sequencing
- Fixed and floating point arithmetic operations and implementation
- Datapath and processor organization
- Hardwired and microprogrammed control implementation
- Pipelining, hazards, stalls, and control
- Memory hierarchy, main memory, cache memory, virtual memory
- Example processors: PowerPC and 80X86/Pentium