FACULTY COURSE ASSESSMENT REPORT

Department of Biomedical Engineering

Academic Year: **2011-2012**
Term: **Fall 2011**

Course Code and Title: **BME130 Biomedical Signals and Systems**

Instructor: **Zoran Nenadic, DSc**

Background: Please review the *ABET background* document.

Instructions: For each student outcome performance indicator, identify (1) the assignment (which quiz, quiz problem, exam problem, or project) was used to assess that indicator, (2) the maximum score possible on that assignment, (3) the performance standard for that assignment expressed in points and also as a percentage of max, (4) the number of students who were assessed on that assignment, (5) the average score achieved by them expressed in points and percentage of max, and (6) the number and percentage of BME students who achieved the performance standard.

Performance Indicators (PIs): This course assesses the following Performance Indicators (please consult the *Proposed Remapping of BME courses to Student Outcomes* document): **a1, k2.**

a1 — Students can apply knowledge of mathematics to problems in Biomedical Engineering
k2 — Use software tools to model biomedical systems, and analyze and interpret biomedical data.

PIs	Assignment used for assessment	Max. score	PI standard and % of maximum	Number of students tested	Average score and % of maximum	Number and % of BME students who met the standard
(a1)	HW#1 (2,4,5-8,11,12)	114	76.00 (66.67%)	76	89.83 (78.80%)	65 (85.53%)
	HW#2 (all)	143	95.33 (66.67%)	76	121.00 (84.62%)	66 (86.84%)
	HW#3 (all)	86	57.33 (66.67%)	76	69.20 (80.46%)	63 (82.89%)
	HW#4 (all)	139	92.67 (66.67%)	76	120.30 (86.55%)	65 (85.53%)
	HW#5 (all)	115	76.67 (66.67%)	76	101.55 (88.31%)	70 (92.11%)
	HW#6 (all)	105	70.00 (66.67%)	76	90.38 (86.08%)	67 (88.16%)
	HW#7 (all)	120	80.00 (66.67%)	76	98.14 (81.79%)	68 (89.47%)
	HW#8 (all)	115	76.67 (66.67%)	76	108.59 (94.43%)	73 (96.05%)
	Midterm#1 (all)	100	66.67 (66.67%)	76	57.63 (57.63%)	17 (22.37%)
	Midterm#2 (all)	100	66.67 (66.67%)	76	68.48 (68.48%)	50 (65.79%)
	Final Exam (all)	100	66.67 (66.67%)	76	67.45 (67.45%)	42 (55.26%)
	Average:				**(79.51%)**	**58.73 (77.27%)**
(k2)	HW#7 (1,5)	120	80.00 (66.67%)	76	98.14 (81.79%)	68 (89.47%)
	Average:				**(81.79%)**	**68 (89.47%)**

Course Learning Outcomes: This course assesses the following Course Learning Outcomes (please consult your *Course Outline* document):

CLO1: Students will be able to understand the nature of common biomedical signals **(a,k)**.
CLO2: Students will be able to apply the essential techniques for analyzing analog and digital biomedical signals **(a,k)**.
CLO3: Students will be able to analyze linear time invariant systems **(a,k)**.
CLO4: Students will be able to develop computing skills by using MATLAB for signal analysis and system modeling **(k)**.

CLOs	Assignment used for assessment	Performance standard	Number of students tested	Average score (%)	Number and % of BME students who met the standard
1	HW#1-8,Midterm#1-2,Final Exam	66.67%	76	79.51%	58.73 (77.27%)
2	HW#1-8,Midterm#1-2,Final Exam	66.67%	76	79.51%	58.73 (77.27%)
3	HW#1-8,Midterm#1-2,Final Exam	66.67%	76	79.51%	58.73 (77.27%)
4	HW#7	66.67%	76	81.79%	68 (89.47%)

What changes did you make in this course based on previous assessment results?

Created more examples (midterms and final) with biomedical relevance.
Used randomized seating assignment during midterms and exams to minimize the effect of cheating.

What recommendations do you have for improving the course the next time it is taught?

Skip the lecture on differential equations since this topic is a prerequisite.
Implement better alignment of homework and PIs, so it becomes easier to perform assessment. For example, if a homework assignment is mapped to a particular PI, assign more weight to those problems that are linked to the PI.
Reduce the weighing of the homework assignments on the final grade (from 30% to 20%).
Increase the weighing of the midterms from 20% to 25%, for a total of 50%.

What recommendations do you have, if any, regarding prerequisite courses or other ways to improve student preparation for this course?

Based on recommendations from Undergraduate Committee, a new course BME60C will be added as a prerequisite for BME130 in the future.

Any other recommendations or comments?

No