FACULTY **C**OURSE **A**SSESSMENT **R**EPORT

Department of Biomedical Engineering

Academic Year: **2012-2013**
Term: **Winter 2013**

Course Code and Title: **BME121 Quantitative Physiology: Organ Transport Systems**

Instructor: **Jered B. Haun, Ph.D.**

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): **a2, d1, d2, d3, d4, i1.**

a2 — Students can apply knowledge of science to problems in Biomedical Engineering.
d1 — Students understand team and project objectives.
d2 — Students combine skills and methods from different disciplines.
d3 — Students participates in team activities.
d4 — Students complete assigned duties.
i1 — Students can access resources to solve open-ended biomedical problems.

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
(a2)	HW#1 (all)	10	5.00 (50.00%)	98	5.97 (59.70%)	62 (63.27%)
	HW#2 (all)	10	5.00 (50.00%)	98	6.42 (64.20%)	80 (81.63%)
	HW#3 (all)	10	5.00 (50.00%)	98	8.25 (82.50%)	92 (93.88%)
	HW#4 (all)	10	5.00 (50.00%)	98	9.13 (91.30%)	93 (94.90%)
	Midterm (all)	100	40.00 (40.00%)	98	46.16 (46.16%)	65 (66.33%)
	Final (all)	100	40.00 (40.00%)	98	51.67 (51.67%)	82 (83.67%)
	Average:				**(65.94%)**	**79 (80.61%)**
(d1)	Group Projects - Written Reports	100	80.00 (80.00%)	98	86.94 (86.94%)	84 (85.71%)
	Average:				**(86.94%)**	**84 (85.71%)**
(d2)	Group Projects - Written Reports	100	80.00 (80.00%)	98	86.94 (86.94%)	84 (85.71%)
	Average:				**(86.94%)**	**84 (85.71%)**
(d3)	Group Projects - Written Reports	100	80.00 (80.00%)	98	86.94 (86.94%)	84 (85.71%)
	Average:				**(86.94%)**	**84 (85.71%)**

(d4)	Group Projects - Written Reports **Average**:	100	80.00 (80.00%)	98	86.94 (86.94%) **(86.94%)**	84 (85.71%) **84 (85.71%)**
(i1)	Group Projects - Written Reports **Average**:	100	80.00 (80.00%)	98	86.94 (86.94%) **(86.94%)**	84 (85.71%) **84 (85.71%)**

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

CLO1: Describe and identify basic anatomical features of the pulmonary and cardiovascular systems **(a)**.
CLO2: Describe both qualitatively and quantitatively the fundamental physiological functions of the pulmonary and cardiovascular systems **(a)**.
CLO3: Perform fundamental mass balances as applied to physiological systems, and solve the resulting first and second order differential equations **(a)**.
CLO4: Apply knowledge of anatomy and physiology of the pulmonary and cardiovascular systems together with basic engineering principles to design solutions to current biomedical problems **(a, i)**.
CLO5: Formulate strategies in multidisciplinary teams to address current biomedical problems using information and resources from outside of the classroom environment **(a, d, i)**.

CLOs	Assignment used for assessment	Performance standard	Number of students tested	Average score (%)	Number and % of BME students who met the standard
1	Midterm and Final Exams	40.00%	98	48.92%	73.5 (75.00%)
2	HW#1-4/Midterm and Final Exams	50.00/40.00%	98	65.94%	79.0 (80.61%)
3	HW#1-4/Midterm and Final Exams	50.00/40.00%	98	65.94%	79.0 (80.61%)
4	Group Projects - Written Reports	80.00%	98	86.94%	84.0 (85.71%)
5	Group Projects - Written Reports	80.00%	98	86.94%	84.0 (85.71%)

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

This year I added more opportunities for students to see example problems solved in the discussion sections. I also added chalk-board based lectures early in the class, although I was not able to carry this through later because the screen was broken (stuck in the down position, blocking the board) in my classroom.

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

The biggest challenge this year was the classroom that I was assigned. The lecture hall was too small for the class size, seating 139 for a class roster of 138. Although I arranged for an overflow classroom for exams, it was still a challenge. Also the lecture hall was designed for the humanities (Humanities Hall 178), so classroom technology was very limited. For example, there was no tablet available, and I made heavy use of this capability the previous year. Not being able to write on my Powerpoints slides resulted in some lectures being delivered much too quickly. Also, the four discussion sections were each offered in two small classrooms. Due to the limited number of TAs for the class (3), I could only reasonably assign a single TA to each discussion, which required them to move back and forth between the two rooms. Therefore, a single large classroom seating greater than 50 students is needed for the discussion sections.

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

The main limitation regarding prerequisites is that the students have not yet had basic exposure to transport phenomena, so I need to give them a simplified primer during the first class. It is asking a lot of these students to integrate this new knowledge along with the extensive anatomy and physiology. Currently fluid dynamics (BME110C) and mass transport (BME150) are held in the spring following this course. Changing the sequence by swapping the order or moving BME121 to the fall of the senior year would help alleviate this issue.

Any other recommendations or comments?

None