INSTITUTIONAL EFFECTIVENESS REVIEW

~ PHYSICS AND ENGINEERING / 2008-2009 ~

The purpose of the review is to:

Assess the currency, scope, strengths, weaknesses and needs of the physics/engineering department.

The process will involve the following steps:

The physics/engineering program faculty will meet with the Dean and Division Chair to discuss the Institutional Effectiveness Review (IER) process.

The IER document will be completed based on data compiled by the physics/engineering program faculty.

The physics/engineering program faculty will meet again with the Dean to discuss the findings presented in the IER document.

Additional follow-up meetings will be scheduled as needed to assess the status of Learning Goals and Action Plans.

Time frames/timeline for the review will be:

The initial meeting with the Dean will take place during the Fall 2008 semester.

The IER document will be turned in to the Dean by the middle of April 2009.

The follow-up meeting with the Dean will take place in late April 2009

Additional follow-up meetings will be scheduled as needed.

Program/Service: Physics and Engineering
Date of Review: April 2009
Review Participants: Cliff Castle, Tom Schuessler and Marianne Angliongto

Overview

Purpose of the program and how it relates to college mission, values, vision:

The physics/engineering program offers courses that prepare non-science, science, and engineering majors for further study. Efforts have been made to make the various physics and engineering courses compliant with the college's general education objectives. Reading and writing, not just solving physics problems, have become integral parts of all courses offered in the physics department. The physics faculty make every effort to stay current in both their field of study and the latest teaching techniques.

Institutional Effectiveness Review

Present Status

Learning/Service and Action from 2004 Institutional Effectiveness Review:

Students will:

Learning/Service Goal	*Assessment Measurement/ Action*	*Person(s) to Implement*	*Timeframe*	*Resource Implications*	*Use of results*
Goal 1	Determine ways to collaborate with the math faculty to support student success.	Cliff Castle (faculty)	Completed	None	Math and physics faculty continually work together to assure student success in physics and engineering courses.
Goal 2	Develop an astronomy class to meet the needs of science majors and elementary education majors.	Tom Schuessler (faculty)	Completed Fall 2006	Course Development Funds and Plant Funds for Telescopes	The astronomy course is currently offered each Spring semester.
Goal 3	Develop efforts to increase enrollments in the engineering program.	Cliff Castle (faculty)	In Progress	Course Development Funds	Enrollment in EGR courses increased by 29.8% from 2004 to 2009.
Goal 4	Establish plan to replace computers in AS216 and AS231 and update software.	Tom Schuessler, Maryanne Angliongto, Cliff Castle (faculty)	Completed Summer 2008	Plant Funds	Students have access to the latest in computer hardware and software. This also applies to students taking survey at the Northwest site.

Innovative Changes (in last 5 years):

New physics labs have been integrated into several physics courses.

A new course in astronomy was added in Fall 2006.

The computer lab in AS 231 was renovated to better accommodate students

New telescopes were purchased to expand enrollment, and increase student learning in Astronomy.

Hand-held Pasco Dataloggers were purchased for engineering students.

Faculty (Degree to which faculty/staff are qualified, effective, and supported.)

Faculty Qualifications and Professional Development:

Name	Title	Highest Degree	Institution	Graduate Hrs
Cliff Castle	Professor	Master of Science	Drake University	37
Tom Schuessler	Professor	Master of Arts in Teaching	Webster University	32
Maryanne Angliongto	Lab Instructor	Master of Science	California State University at Los Angeles	46 (quarter hours)

Maryanne Angliongto has been a full-time instructor at Jefferson College since the Fall of 2007. She earned her A.A.S. from ITT Technical Institute in Electronics Engineering Technology, her B.S./B.A. from UCLA in Astrophysics and Ancient Near Eastern Civilizations, and her M.S. from California State University, Los Angeles, in Physics, with her thesis research on asteroid photometry. Ms. Angliongto has worked in electronics production at the UCLA Infrared Instrumentation Laboratory, which has built instrumentation for the Keck Telescope in Hawaii. She enjoys hiking, camping, traveling, reading, astronomy, live concerts, and learning new subjects.

Cliff Castle, a Vietnam veteran, came to Jefferson College in 1976. He holds a B.A. from Augustana College and an M.S. from Drake University. Mr. Castle teaches the pre-engineering curriculum. Over the years he has developed excellent relationships with the Missouri University of Science and Technology's (Missouri S&T) various schools of engineering. Mr. Castle has served on the following institutional committees: Library, Academic Affairs, Student Retention, Student Outcomes, Energy, and Student Conduct. He consistently receives top evaluations from students and has been awarded the NISOD

award for excellence in teaching, as well as the Governor's Award as an outstanding educator. Mr. Castle is a member of the American Association of Physics Teachers, the Missouri Association of Physics Teachers, and the History of Science Society.

Tom Schuessler has been a full-time instructor at Jefferson since the fall of 1992. He has a Bachelor of Science in Physics from Washington University and a Master of Arts in Teaching Science from Webster University. He received the Emerson Electric Excellence in Teaching Award in 1998 and has appeared in *Who`s Who Among America`s Teachers* three times. Prior to teaching, Mr. Schuessler worked in industry as a biomedical technician and as a biomedical engineer. He has also worked as a professional magician.

Faculty Data:

Faculty Indicators for Physics/Engineering (PHY, EGR) Instructional Program Review, 2004-2008
School Terms 200401 through 200803 (Summer 2003 through Spring 2008)

Number of Terms Taught (Max = 15)	Number of Course Sections Taught	Total Students	Attrition Number ("W" Grades)	Attrition Percent	Graded Credit Hours (A to F grades)	Average Students	Average GPA	Annualized 5-Year Program FTE
68	153	3,258	209	6.4%	11,426	---	---	---
						21.3	2.82	76.2

Source: BANNER report WSHRGDST printed 26 September 2008.
Notes: Attrition is the number of "W" grades conferred.
Annualized Program FTE is the number of graded credit hours divided by 150 (30 hours/yr for 5 years).
Graded Credit Hours are "A to F" only, not "W, I, H. P/F, or Other")

Faculty yearly formative and summative performance reviews are conducted each Spring semester by the Division Chair, and include:

1. Self-assessment of Classroom Innovations, Academic Activities, Institutional Service, Scholarly Endeavors, and Community Service
2. Summary of student feedback
3. Goals for the coming year

These reviews are on file at Human Resources.

Students (The degree to which student needs are met.)

Enrollment in PHY and EGR classes have been steady, averaging 219 credit hours per year for EGR, and 2217 for PHY.

Physical science classes provide hands-on science experience to meet general education requirements. These experiences are particularly pertinent to elementary education majors. A physical geology class was added in Fall 2004, and an astronomy class was added Fall 2006. These courses give our students other physical science options.

PHY112 and EGR261 typically have low enrollment. Nationally, the typical student who takes PHY112 is majoring in a health related field. Jefferson College recruits few of these students, but the course is necessary to support those students who we do have. The low enrollment in EGR261 stems from the fact that approximately one third of our incoming engineering students are not prepared to take Calculus I. This then impacts the classes the students can take their last semester which is when EGR261 is offered.

Student Satisfaction and Feedback:

A review of student evaluations by members of the physics/engineering program faculty indicate that they find the courses very interesting and enlightening, particularly learning about the history of science. They report that the classes are enjoyable because of the dynamic teaching styles employed. They also appear to find the classes "hard," or demanding, but the vast majority rate them as "above average" or "excellent."

Student Success:

Average GPA = 2.83 for all PHY courses from Summer 2003 to Spring 2008
Average GPA = 2.89 for all EGR courses from Summer 2003 to Spring 2008

The attrition rates for the five year period were 6.3% for physics, and 6.4% for engineering.

Our teacher education cohort score at or above the national average for physical science on the CBASE test. (data available on the College Reports tab in STARS)

Follow-up studies of our Engineering students who transfer to Missouri University of Science and Technology show that if a student has done well at Jefferson College he or she has performed well at Missouri S&T. Professor Castle administers a test to the students in Circuit Analysis (EGR261) that they are required to pass in order to transfer credit for the course to Missouri S&T and has not had a single student fail the test in ten years.

Curriculum (The degree to which curriculum is thorough, current, and supported.)

Official course syllabi have been reviewed and revised for currency and scope: these are on file in AS 110 and on the web at:

http://www.jeffco.edu/jeffco/index.php?option=com_content&task=view&id=124&Itemid=115

The General Education Matrix shows how PHY courses fit into the General Education curriculum, and can be found at:

http://vega.jeffco.edu/jkuchar/acadprog/gened/course-credit_hours.htm

Course assessment logs are on file in the Center for Teaching and Learning.

Curriculum (Scope, Currency, Changes):

PHY101 Survey of Physical Science
PHY102 Topics in Physical Science
PHY105 Physical Geology (New in Fall 2004)
PHY106 Introduction to Astronomy (New in Fall 2006)
PHY108 Technical Physics (Inactive)
PHY111 Elementary College Physics
PHY112 Elementary College Physics II
PHY118 Introduction to Physics
PHY223 General Physics
PHY224 General Physics II

EGR101 Computer Aided Engineering Design
EGR228 Engineering Mechanical Statics
EGR250 Engineering Mechanical Dynamics
EGR 261 Circuit Analysis I

Curriculum Issues (Support, Technology, Equipment)

In the past five years, new telescopes have been purchased for use in Introduction to Astronomy, and the software in the physics lab has been updated to the most recent version. The software has also been installed in the labs at our other sites. We have also purchased new lab supplies for Arnold and electronic kits for Arnold and Northwest.

While the lab facility in Hillsboro is fully stocked, this cannot be said about our remote sites. Instructors frequently need to borrow materials from Hillsboro. This needs to be addressed, as borrowing becomes difficult when adjuncts are teaching these sections.

Community (The degree to which the program contributes to the community and responds to community needs)

Cliff Castle is a very active member of the DeSoto Elks Lodge as well as the Missouri Elks Association. He is directly involved in the awarding of college scholarships from this organization.

The department participated in Math-Science Night held for high school juniors to introduce them to programs and courses offered by Jefferson College.

The department participates in A+ Night in the pursuit of new students. Physics faculty are also a part of the Jefferson College Speakers Bureau.

Department members frequently respond to questions from the community on several topics, especially in Geology.

Cost

A summary of the physics & engineering budget for 2004-2008 is on file in the Office of the Arts & Sciences Dean. The cost per FTE for P&E courses is $3,182.95.

Summary (SWOT)

Strengths	Weaknesses
1) Strong and experienced faculty 2) Growth in enrollment at Jeffco should benefit all programs 3) High student satisfaction 4) Good retention 5) Variety of course options	1) Shortage of lab supplies in Arnold 2) Low enrollment in Engineering courses
Opportunities	**Threats**
1) Citizens searching for new careers	1) Possible reduction in funding 2) Declining preparedness level of incoming students

Future (Proposed Learning and Service Goals and Action Plan)

Proposed Learning/Service Goal	*Proposed Assessment Measurement/ Action*	*Person(s) to Implement*	*Timeframe*	*Resource Implications*
Goal 1 Recruit more science engineering majors	Develop materials to be used by recruiters and faculty members (e.g. at A+ Night)	All	Ongoing	Printing cost
Goal 2 Target working teachers for our geology and astronomy courses	Develop materials to be distributed to local teachers	Tom and Skyler	Ongoing	Printing cost
Goal 3 Increase consistency between full-time and adjunct instructors in Survey and Topics	Develop a manual for adjuncts to let them know exactly what is expected Perhaps some common assessment	Tom, Skyler, and Maryanne	Fall 2010	None
Goal 4 Get more involved with Mastodon	Volunteer to judge	All	Spring 2010	None
Goal 5 Fully stock lab facilities at Arnold and Northwest	Assess needs and purchase supplies	Maryanne and Skyler	Fall 2010	Department funds will be utilized
Goal 6 Facilitate advisement of pre-healthcare students into PHY111	Work with ARC to develop "sequences" Compare local 4-years to determine which require the physics sequence for their majors	Cliff and Skyler	Ongoing	Printing cost

DISCIPLINE STATUS

___X___ Satisfactory
_____ Requires Immediate Attention
_____ Unsatisfactory

M.K. Selsor

Dean

Date