

COMMISSION FOR HIGHER EDUCATION

Friday, June 11, 2010

DECISION ITEM A-3:

Bachelor of Science in Energy Engineering To Be Offered by Purdue University through the IUPUI Campus

Staff Recommendation

That the Commission for Higher Education approve the Bachelor of Science in Energy Engineering to be offered by Purdue University through the IUPUI Campus, in accordance with the background discussion in this agenda item and the *Abstract*, May 28, 2010; and

That the Commission recommend no new state funds, in accordance with the supporting document, *New Academic Degree Program Proposal Summary*, May 28, 2010.

Background

Purdue University reports that no baccalaureate energy engineering programs exist in the Midwest, and only a handful are in place nationwide. The proposed program will be offered through the Departments of Mechanical Engineering and Electrical and Computer Engineering, both of which presently offer energy-related concentrations. Two new FTE faculty positions will need to be created to support the program, with faculty expertise covering six major areas: solar energy, wind energy, fuel cells, bio-fuels, power electronics, and material engineering. The IUPUI campus has become the focus of considerable renewable energy research, with one major center – the Richard G. Lugar Center for Renewable Energy – resulting in \$5 million of external funding. Considerable possibilities exist for funding from government and private sources, and IUPUI has created partnerships with many companies in the renewable energy industry, including companies that manufacture energy products or produce energy.

Through intensive efforts involving IUPUI, Ivy Tech, and Commission staff, a 2+2 articulation agreement is almost finalized and is expected to be signed this month. The articulation is with the Ivy Tech A.S. in Pre-Engineering, and allows all but four credit hours in the 66 credit hour Ivy Tech curriculum to apply toward the B.S. in Energy Engineering, with Community College graduates needing to take an additional 69 credit hours at IUPUI to complete their baccalaureate degree within two years.

Furthermore, IUPUI and Ivy Tech have developed a far-reaching plan for completing articulation pathways for

additional engineering disciplines: Biomedical Engineering, Electrical and Computer Engineering, Mechanical Engineering, and Motorsports Engineering. The University and the College are committed to finalizing 2+2 agreements for these disciplines by December 2010. A commitment to develop the additional articulation agreements was a critical step in bringing forward the recommendation on this program.

Supporting Documents

- (1) *Abstract - Bachelor of Science in Energy Engineering To Be Offered by Purdue University through the IUPUI Campus, May 28, 2010.*
- (2) *New Academic Degree Program Proposal Summary – B.S. in Energy Engineering, May 28, 2010.*

Abstract

Bachelor of Science in Energy Engineering
To Be Offered by
Purdue University through the IUPUI Campus

May 28, 2010

Objectives: To address the need for engineers who can contribute quickly in energy-related businesses and professionals who can join the workforce to support the research and development of the energy technologies.

Clientele to be Served: Students who wish to study and work in the energy industrial sectors with a baccalaureate degree and who have potential to continue on research and development at masters' and Ph.D. degree levels.

Curriculum: A total of 129 semester credit hours are required to complete the program, distributed as follows:

Engineering Core (72 credit hours)

- Introduction to the Engineering Profession (1)
- Introduction to Engineering (3)
- Introduction to Programming Concepts (2)
- Computer Tools for Engineering (1)
- Thermodynamics I (3)
- Basic Mechanics (4)
- Strength of Materials (4)
- Introduction to Electrical and Electronic Circuits (4)
- Fluid Mechanics and Heat Transfer (5)
- Electromechanical Motion Devices (3)
- Introduction to Engineering Materials (3)
- Dynamic Systems Modeling and Measurements (4)
- Control Systems Analysis and Design (3)
- Capstone Design (3)
- FE Preparation and Seminar (1)
- Physical and Engineering Chemistry (4)
- Introduction to Energy Systems and Sustainability Metrics (3)
- Renewable Energy Systems and Design (3)
- Electric Power Networks and Interfaces (3)
- Energy System Electives (12)
- Clean Power Generation (3)

Technical Electives (6 credit hours)

- Humanities and Social Science Electives (21 credit hours)
- Engineering Ethics and Professionalism (1)
- Communication in Engineering Practice (2)
- General Education Elective (9)
- Engineering Economics (3)

- Elementary Composition I (3)
- Fundamentals of Speech Communication (3)

Mathematics and Science (30 credit hours)

- Integrated Calculus and Analytic Geometry I & II (8)
- Multidimensional Mathematics (3)
- Multivariate Calculus (4)
- Differential Equations (3)
- Mechanics (4)
- Heat, Electricity, and Optics (5)
- Chemical Science I (3)

Employment Possibilities: This program will primarily educate graduates for careers in energy-related companies, research institutes, and academic institutions.

NEW ACADEMIC DEGREE PROGRAM PROPOSAL SUMMARY

May 28, 2010

I. Prepared by Institution

Institution/Location: Purdue University to be offered through the IUPUI campus
 Program: B.S. in Energy Engineering

	Year 1 FY2011	Year 2 FY2012	Year 3 FY2013	Year 4 FY2014	Year 5 FY2015
Enrollment Projections (Headcount)					
Full-Time	15	34	53	72	76
Part-Time	6	12	18	24	48
Total	21	46	71	96	124
Enrollment Projections (FTE)					
Full-Time	17	39	60	78	82
Part-Time	3	7	10	13	25
Total	20	45	70	91	106
Degree Completions Projection	0	0	0	15	25
New State Funds Requested (Actual) *	-0-	-0-	-0-	-0-	-0-
New State Funds Requested (Increases) *	-0-	-0-	-0-	-0-	-0-

II. Prepared by CHE

New State Funds To Be Considered For Recommendation (Actual) *	-0-	-0-	-0-	-0-	-0-
New State Funds To Be Considered For Recommendation (Increases) *	-0-	-0-	-0-	-0-	-0-

CHE Code: 10-10
 Campus Code: 1813
 County: Marion
 Degree Level: 05
 CIP Code: Federal – 149999; State – 149999

* Excludes new state dollars that may be provided through enrollment change funding.