NEW, REVISED, OR DELETED PROGRAM COVER SHEET
2007-2008
University Curriculum Committee
Undergraduate Programs (Majors, Minors, Sequences)

INSTITUTION: Illinois State University
DEPARTMENT/SCHOOL: Technology DATE : September 29, 2006

A. **Proposed Action:** (more than one item may be checked if a revision).

____**XX**___ New Major CIPS CODE _15.503___ (obtain from Planning, Policy Studies and Info Systems)

_____ New Minor CIPS CODE _____ (obtain from Planning, Policy Studies and Info Systems)

____**XX**____ New Sequences (1) Technical Sequence; (2) Economics and Public Policy Sequence

_____ Change in requirements for major

_____ Change in requirements for minor

_____ Change in requirements for sequence

_____ Other program revisions

_____ More than 50% of courses in this program are distance education.

_____ Program deletion

B. **Summary of proposed action** (see Part A), including title and exact *Undergraduate Catalog* copy for a new or altered program. (See *Catalog* and Program Checklist for format and examples.) Provide a summary of the revisions in addition to the exact current *Catalog* copy.

Create multi-disciplinary Major in Renewable Energy with two sequences. Program includes four new courses: AGR 225, ECO 236, TEC 160 and TEC 360. Related change includes a modification of prerequisites for ECO 335. Catalog copy for the major is attached. Additional catalog changes will be associated with individual new courses and course changes.

C. **Routing and action summary:**

1. _____ Department/School Curriculum Committee Chair	_____ Date Approved	4. _____ College Dean	_____ Date Approved
2. _____ Department Chair/School Director	_____ Date Approved	5. _____ Teacher Education Council Chair if appropriate (10 copies to the Dean of the College of Education)	_____ Date Approved
3. _____ College Committee Chair	_____ Date Approved	6. _____ University Curriculum Committee Chair (8 copies to UCC Secretary, Moulton 108A)	_____ Date Approved

Submit 8 copies of **NEW** Undergraduate proposals to University Curriculum Committee
Submit 8 copies of **REVISED** Undergraduate proposals to University Curriculum Committee
All new and deleted programs (majors, minors, sequences) are routed by the U.C.C. to the Academic Senate. **The Senate rules mandate electronic submission (in MS Word or HTML format) of all materials for Web site posting.**
3/05

1. Name of Institution	Illinois State University
2. Title of Proposed Program	Major in Renewable Energy
3. Previous Program Title:	Not applicable
4. Six-Digit CIPS code:	15.503: Energy Management and Systems Technology/Technician
5. Proposed date for Initiation of Program:	August, 2007

6. Description of Program: A multi-disciplinary undergraduate major that provides a broad overview of renewable energy industries. Program consists of two sequences: one with an emphasis on technical issues and one with an emphasis on economics and policy-related issues.

7. Rationale for proposed major:

The energy industry powers all other industries in the US economy. With the increased price of fossil fuels and global political instability, the United States has begun to search more seriously for renewable alternatives to fossil fuels. President Bush highlighted the national priority of renewable energy development in his State of the Union Address in 2006. The renewable energy industry is growing fast with Shell International predicting that renewable energy will supply 60% of the world's energy by 2060 (National Renewable Energy Laboratory, 2006)

Many new workers will be needed in the renewable energy industry. There are currently about 100 operating ethanol plants in the U.S. with about 30 more under construction and an additional 100 plants at various stages of development. U.S. ethanol production has more than doubled in the past four years and now exceeds 5 billion gallons per year. Investment in new ethanol plants in Illinois will generate 800 plant jobs and 4,000 industry-related service jobs (Country Spirit, 2006). Three large wind farms are being sited within miles of the University campus and will require skilled workers. According to a University of Illinois at Chicago study, new renewable energy standards for electric utilities will create 7,800 new jobs in wind energy and other renewable sectors through 2012 (Worek, 2005). In addition to new growth, the energy sector faces an aging workforce and widespread retirements. Seventy percent of energy workers are between age 41 and 65, with a large percentage in the 55-65 age group (Kohl, 2006). Graduates of the proposed program will be well-positioned to compete for new and existing jobs.

The proposed renewable energy undergraduate major will be a broad-based program addressing the social, economic, and technical issues that graduates will encounter in the emerging field of renewable energy. It will be based on a foundation of existing courses in several departments but will be strengthened by the development of new courses in the Departments of Agriculture, Economics, and Technology. Students will be able to specialize by choosing between two sequences – a technology sequence or an economics/public policy sequence. The proposed major is unique in Illinois and is one of a few undergraduate programs nationwide devoted to renewable energy.

With support from the U.S. Department of Energy grant, we have established a curriculum advisory committee. Members of the committee represent a broad cross-section of the energy industry. Members of the committee have reviewed and endorsed the content and structure of the proposed major. Letters of support from several of the committee members are attached to this proposal.

8. Expected impact on other programs.

The proposed multi-disciplinary program draws upon a number of existing courses from several departments. Attached letters from the Chairpersons of the Departments of Agriculture, Economics, Health Sciences; Geography/Geology, Politics and Government, Psychology**,** and Mathematics indicate the capacity of these departments to accommodate the anticipated enrollments from the majors in the proposed program. We do not have a letter of support from the Department of Physics but we have met in person with the Department Chairperson and faculty members who teach the required Physics courses in the program. During that meeting, representatives from the Department of Physics indicated a strong interest in supporting the proposed program and the capacity to accommodate the additional students in the required Physics courses.

The Department of Technology is significantly impacted by the proposed program as a result of nine courses in the core and/or the technical sequence. Current faculty FTE is not sufficient to meet the additional demand projected by the proposed program if it grows as anticipated. To address this deficiency in capacity, a tenure-track faculty position for the Department of Technology will be requested through the regular budget processes. The support of the Department of Technology and the ability to offer the program, as proposed, over the long run is contingent upon the addition of the new tenure-track position in Technology. Short-term capacity issues can be addressed by grant resources and the gradual increase in program enrollment.

Representatives of Milner Library have also had the chance to review the proposed program and evaluate the holdings and resources of the library that pertain to or would help support the program. The Dean of the Library has pledged up to $5,000 to purchase additional materials to support the proposed program (letter attached to the proposal).

9. Expected curricular changes:

The proposed program includes four new course proposals:
AGR 225: Agriculture and Renewable Energy
ECO 236: Economics of Energy and Public Policy
TEC 160: Introduction to Renewable Energy Systems
TEC 360: Capstone in Renewable Energy
Proposals for the new courses accompany the program proposal. The course proposals address the plans for incorporating the new courses into the regular offerings of the respective departments.

In addition, there is a minor change in prerequisites that is being proposed. The prerequisite for ECO 335: Economics of Regulation and Antitrust will be changed from ECO 240 to ECO 239 or 240. This change has already been requested and approved.

General education required courses: Table 1 below lists the required courses for the proposed major. Several of the courses are also part of the Illinois State University General Education program, as identified in Table 1. All of the required general education courses are prerequisites for other required courses in the proposed program except for those courses that are in the OC-SMT category. We request an exemption from the limitation concerning requiring general education courses that are not prerequisites for other required courses for this group of courses because we are not singling out a course in the category but rather are requiring multiple courses from this single general education category.

General education exemption: Request exemption from OC-SS for the Renewable Energy major. Students in the program take a broad selection of courses in or related to the social sciences including psychology, economics, political science, geography and agriculture. In addition, students are required to take two (or three in the economics/public policy sequence) additional general education courses in the OC-SMT category.

Hidden requirement: POL 101, 105, or 106 is a prerequisite for POL 232, a course that is required in the economics/public policy sequence. Students who select this sequence will need to satisfy this prerequisite. CHE 102 or 110/112; and MAT 120 are hidden requirements for students who choose the HSC 271 course. It should be noted that students may take HSC 385 instead of HSC 271 thereby eliminating these hidden requirements.

10. Catalog Copy:

Major in Renewable Energy

Degree Offered: B.S.

The Major in Renewable Energy is administered by the Department of Technology. Students will be admitted to the program from a pool of applicants on the basis of individual qualifications on a competitive and selective basis. The number of students admitted to the major may vary from year to year depending on program capacity and qualifications of the applicants.

The Major in Renewable Energy prepares students for careers in renewable energy and related industries, including wind energy, solar power, and biofuels. The program provides the opportunity to specialize in technical aspects of the industry or in economics and public policy aspects of the industry.

Technical Sequence

-- 66 hours required.

-- 51 hours in required core courses: AGR 225; ECO 105, 138*, 236, 239; GEO 211*; HSC156*; MAT 120*; PHY 105*, 207*; PSY 131*, TEC 111, 160, 270, 320, 360.

--15 hours in required courses for the Technical sequence: HSC 271 or 385; TEC 240, 263, 292, 345.

Economics and Public Policy Sequence

-- 66 hours required.

-- 51 hours in required core courses: AGR 225; ECO 105, 138*, 236, 239; GEO 211*; HSC156*; MAT 120*; PHY 105*, 207*; PSY 131*, TEC 111, 160, 270, 320, 360.

--15 hours in required courses for the Economics/Public Policy sequence: AGR 203*; ECO 255, 335; GEO 205; POL 232.

*Note: ECO 138, GEO 211, HSC 156, MAT 120, PHY 105, PHY 207, PSY 131and AGR 203 are General education courses.

Allowable substitutions for required courses:

- Allowable substitution for ECO 138 is MQM 100
- Allowable substitution for MAT 120 is MAT 121, 144, or 145
- Allowable substitution for PHY 105 is PHY 108 or 110
- Allowable substitution for TEC 270 is MQM 220

Table 1: Listing of required courses for proposed Major in Renewable Energy

		Renewable Energy Core-Required	Hours	GE Group	Prereqs
AGR	225	Renewable Energy and Agriculture	3		
ECO	105	Principles of Economics	4		
ECO	138	Economic Reasoning Using Statistics	3	MC-QR	
ECO	236	Economics of Energy and Public Policy	3		
ECO	239	Managerial Economics	3		ECO 101 or 105
GEO	211	Earth's Dynamic Weather	3	OC-SMT	Inner core
HSC	156	Environmental Health	3	OC-SMT	Inner core
MAT	120	Finite Mathematics	4	IC-M	MAT 119 or Placement
PHY	105	Fundamentals of Physics	4	IC-NSA	
PHY	207	Energy and Society	3	OC-SMT	Inner core
PSY	131	Social Psychology	3	MC-IS	
TEC	111	Fundamentals of Power Technology	3		PHY 105
TEC	160	Introduction to Renewable Energy Systems	3		
TEC	270	Managing Technological Systems	3		PSY 131
TEC	320	Project Management	3		TEC 270
TEC	360	Renewable Energy Capstone	3		
		Total	51		
		Technical Sequence - Required			
TEC	240	Electrical Circuits & Machines	3		TEC 111 or 143
TEC	263	Automated Fluid Power Systems	3		TEC 111 or 143
TEC	292	Materials Technology	3		MAT 120
TEC	345	Process Control Networks	3		TEC 240 and 263
HSC	271	Safety Technology	3		CHE 102 or 110/112; MAT 120
	Or 385	System Safety			MQM 100 or ECO 138
		Total	15		
		Economics/Public Policy Sequence-Required			

AGR	203	Agriculture and the Environment	3	OC-SMT	
ECO	255	Intro to Environmental and Nat. Res. Econ.	3		ECO 105
ECO	335	Economics of Regulation and Antitrust	3		ECO 239 or 240
GEO	205	Global Environmental Issues	3		
POL	232	Politics and Public Policy	3		POL 101, 105 or 106
		Total	15		
		Total Required in Technical Sequence	66		
		Total Required in Eco/Public Policy Sequence	66		