Section 1. Course Title and Description

Prefix & No.  Course Title                                          Credits
AST 304       Electrical Diagnostics for Farm Machinery       3
AST 304L      Electrical Diagnostics for Farm Machinery Lab   0

Course Description:
This course is designed to help students understand basic electricity, electronics, and electrical machines as applied in agricultural systems. Topics covered include Ohm’s law and Kirchhoff’s law, AC and DC circuits, servicing agricultural electronic systems, troubleshooting techniques and procedures, schematic interpretation, measurement techniques, common sensors and control systems for agricultural equipment, and CANbus communication.

Section 2. Review of Course

Will this be a common or unique course? (select the appropriate option below)

X This course will be a unique course. (Go to Section 3.)

Section 3. Other Course Information

1. Are there instructional staffing impacts?

X No, schedule management. Explain:

We will reduce the frequency of course offerings for AST 342, Applied Electricity & lab, and reduce the number of lab sections offered when AST 342 is taught.

2. Existing program in which course will be offered: Agricultural Systems Technology

3. Proposed instructional method: R - Lecture / L - Laboratory

(may be found at http://www.sdbor.edu/services/academics/AAC/guidelines.htm )

Provide a brief justification:
The traditional lecture method is an efficient way to convey the course material to a lot of students at one time. Smaller laboratory sections will allow the students to get their hands on equipment and test the information they learned in the lecture and see how it actually applies to equipment used in the field.
Section 4. To be completed by Academic Affairs

1. University department code: SABAG

2. Proposed CIP code: 010201
   Is this a new CIP code for this university? _____ Yes _____ X No

NEW COURSE REQUEST
Supporting Justification for On-Campus Review

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1. Provide specific reasons for the proposal of this course and explain how the changes enhance the curriculum.
   This course is being offered based on conversations with employers such as Raven Industries, AGCO, Wilbur Ellis, and South Dakota Wheat Growers. They need employees that are knowledgeable and comfortable with the technology being used on new farm equipment. The agricultural system technology (AST) and agronomy fields are undergoing a revolution using precision agriculture techniques that are changing farming practices. Commonly used agricultural equipment such as combines, sprayers, tractors, and planters have complex electronic circuitry and can have price tags approaching $500,000. A small electrical issue can bring even the most expensive machine to a halt. A modern planter cannot operate without GPS. Electrical systems pose unique problems when a malfunction occurs. It is fairly easy for the untrained eye to spot a loose
bolt or overheated bearing but a malfunction in an electrical system may appear to look just like a functional electrical system. Agronomy students need to understand the technology because many of them are expected to plant and harvest test plots each growing season. Their employers expect them to be able to solve routine equipment problems so they can complete the field operation in a timely manner. Agricultural Systems Technology students are often hired by farm machinery manufacturers to provide customer support for farm equipment. Customers expect quick resolution of any machine issue when a malfunction occurs. This course in electrical diagnostics for farm machinery will help both agronomists and technologists be more efficient and effective for their employers.

2. Note whether this course is:  _________ Required  _________ X _______ Elective

3. In addition to the major/program in which this course is offered, what other majors/programs will be affected by this course?
   Agronomy and Precision Agriculture minor under development

4. If this will be a dual listed course, indicate how the distinction between the two levels will be made.
   NA

5. Desired section size  64 per lecture, 16 per lab section

6. Provide qualifications of faculty who will teach this course. List name(s), rank(s), and degree(s).
   A recruitment action is currently in progress with candidates being interviewed. The position will be filled at the assistant professor level and the incumbent will have a PhD in Agricultural Engineering or a closely related major.

7. Note whether adequate facilities are available and list any special equipment that will be needed for the course.
   Facilities are available

8. Note whether adequate library and media support are available for the course.
   Library and media support is adequate

9. Will the new course duplicate courses currently being offered on this campus?  No

10. If this course may be offered for variable credit, explain how the amount of credit at each offering is to be determined.
    NA