

|                                   |   |
|-----------------------------------|---|
| LSC Use Only No: LSC Action-Date: | UWUCC USE Only No. UWUCC Action-Date: Senate Action Date: |
|                                   | 02-85 App 3/25/03 App 4/29/03                             |

**Curriculum Proposal Cover Sheet - University-Wide Undergraduate Curriculum Committee**

|  |  |
|--|--|
| Contact Person<br><b>Kenneth E. Hershman</b> | Email Address<br><b>hershman@iup.edu</b> |
| Proposing Department/Unit<br><b>Physics</b>  | Phone<br><b>724-357-2371</b>             |

Check all appropriate lines and complete information as requested. Use a separate cover sheet for each course proposal and for each program proposal.

1. Course Proposals (check all that apply)

|  |  |   |
|--|--|---|
| <input type="checkbox"/> New Course      | <input type="checkbox"/> Course Prefix Change              | <input type="checkbox"/> Course Deletion            |
| <input type="checkbox"/> Course Revision | <input type="checkbox"/> Course Number and/or Title Change | <input type="checkbox"/> Catalog Description Change |

|   |   |
|---|---|
| <u>Current</u> Course prefix, number and full title | <u>Proposed</u> course prefix, number and full title, if changing |
|---|---|

2. Additional Course Designations: check if appropriate

|  |  |
|--|--|
| <input type="checkbox"/> This course is also proposed as a Liberal Studies Course. | <input type="checkbox"/> Other: (e.g., Women's Studies, Pan-African) |
| <input type="checkbox"/> This course is also proposed as an Honors College Course. |  |

3. Program Proposals

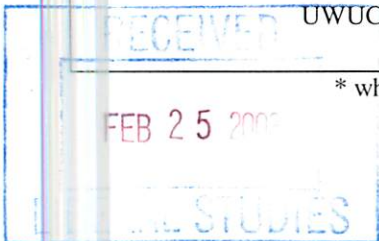
|   |   |  |
|---|---|--|
| <input type="checkbox"/> New Degree Program | <input type="checkbox"/> Catalog Description Change | <input checked="" type="checkbox"/> Program Revision |
| <input type="checkbox"/> New Minor Program  | <input type="checkbox"/> Program Title Change       | <input type="checkbox"/> Other                       |
|   | <input type="checkbox"/> New Track                  |  |

B.S. in Education -- Physics

|                             |   |
|-----------------------------|---|
| <u>Current</u> program name | <u>Proposed</u> program name, if changing |
|-----------------------------|---|

| 4. Approvals  |                              | Date     |
|---|------------------------------|----------|
| Department Curriculum Committee Chair(s)              | <i>Kenneth E Hershman</i>    | 1/31/03  |
| Department Chair(s)                                   | <i>Kenneth E Hershman</i>    | 1/31/03  |
| College Curriculum Committee Chair                    | <i>[Signature]</i>           | 02/11/03 |
| College Dean  | <i>John D Ed</i>             | 02/11/03 |
| Director of Liberal Studies *                         |                              |          |
| Director of Honors College *                          |                              |          |
| Provost *   |                              |          |
| Additional signatures as appropriate: (include title) | <i>Joseph Domonach TECC</i>  |          |
|   | <i>[Signature] for COEGT</i> | 2/24/03  |
| UWUCC Co-Chairs                                       | <i>Gail Schuist</i>          | 3/25/03  |

\* where applicable



## Part II. Description of Curriculum Change

### 1. Catalog Description For The Revised Physics Education Program.

#### Bachelor of Science in Education—Physics (\*)

**Liberal Studies:** As outlined in Liberal Studies section with the following specifications: 55

**Mathematics:** MATH 123

**Natural Science:** CHEM 111-112

**Social Science:** PSYC 101

**Liberal Studies Electives:** MATH 241; BIOL 103, or BIOL 114, or BIOL 115; GEOS 111 or 113.

**College:** 29

#### Professional Education Sequence:

|          |   |      |
|----------|---|------|
| COMM 103 | Digital Instructional Technology  | 3cr  |
| EDUC 242 | Pre-student Teaching Clinical Experience I  | 1cr  |
| EDUC 342 | Pre-student Teaching Clinical Experience II                                       | 1cr  |
| EDUC 441 | Student Teaching  | 12cr |
| EDUC 442 | School Law  | 1cr  |
| EDUC 451 | Teaching Science in the Secondary School  | 3cr  |
| EDSP 102 | Educational Psychology  | 3cr  |
| EDSP 477 | Assessment of Student Learning: Design and Interpretation of Educational Measures | 3cr  |
| EDEX 301 | Education of Students with Disabilities in an Inclusive Secondary Settings        | 2cr  |

**Major:** 32

#### Required Courses:

|          |                                     |     |
|----------|-------------------------------------|-----|
| PHYS 131 | Physics I-C Lecture                 | 3cr |
| PHYS 132 | Physics II-C Lecture                | 3cr |
| PHYS 141 | Physics I-C Lab                     | 1cr |
| PHYS 142 | Physics II-C Lab                    | 1cr |
| PHYS 222 | Mechanics I                         | 2cr |
| PHYS 223 | Mechanics II                        | 2cr |
| PHYS 231 | Electronics                         | 4cr |
| PHYS 242 | Optics                              | 3cr |
| PHYS 322 | Electricity and Magnetism I         | 2cr |
| PHYS 331 | Modern Physics                      | 3cr |
| PHYS 342 | Thermal and Statistical Physics     | 3cr |
| PHYS 350 | Intermediate Experimental Physics I | 3cr |

#### Controlled Electives:

Physics Electives 2sh

#### Other Requirements:

MATH 124 Calculus II for Physics, Chemistry, and Mathematics 4cr

#### Free Electives

0cr

(#) Total Degree Requirements

120

(\*) See requirements leading to teacher certification, titled "Admission to Teacher Education," in the College of Education and Educational Technology section of this catalog.

(#) See advisory paragraph "Timely Completion of Degree Requirements" in the section on Requirements for Graduation.

**2. Summary of Changes**

a. Table Comparing "Old" And "New" Physics Education Programs  
(Changes are shown in bold and italics in the new program.)

| <b>"OLD" PHYSICS EDUCATION PROGRAM</b>  |           | <b>"NEW" PHYSICS EDUCATION PROGRAM</b>  |           |
|---|-----------|---|-----------|
| <b>Liberal Studies:</b> (56-57sh)<br>Mathematics: MATH 123<br>Natural Science: CHEM 111-112<br>Social Science: PSYC 101<br><b>Liberal Studies Electives:</b> MATH 241;<br>BIOL 103; GEOS 110 or 121, or 141, or 221; no<br>courses with PHYS prefix |           | <b>Liberal Studies:</b> (55 cr)<br>Mathematics: MATH 123 (4cr)<br>Natural Science: CHEM 111-112<br>Social Science: PSYC 101<br><b>Liberal Studies Electives:</b> MATH 241, BIOL 103<br>or BIOL 114 or BIOL 115; GEOS 111 or 113 (9cr) |           |
| <b>College:</b>   | <b>30</b> | <b>College:</b>   | <b>29</b> |
| <b>Professional Education Sequence:</b>   |           | <b>Professional Education Sequence:</b>   |           |
| COMM 103 Digital Instructional<br>Technology  | 3sh       | COMM 103 Digital Instructional<br>Technology  | 3cr       |
| EDUC 242 Pre-student Teaching<br>Clinical Experience I  | 1sh       | EDUC 242 Pre-student Teaching Clinical<br>Experience I  | 1cr       |
| EDUC 342 Pre-student Teaching<br>Clinical Experience II   | 1sh       | EDUC 342 Pre-student Teaching Clinical<br>Experience II   | 1cr       |
| EDUC 441 Student Teaching   | 12sh      | EDUC 441 Student Teaching   | 12cr      |
| EDUC 442 School Law   | 1sh       | EDUC 442 School Law   | 1cr       |
| EDUC 451 Teaching Science in the<br>Secondary School  | 3sh       | EDUC 451 Teaching Science in the<br>Secondary School  | 3cr       |
| EDSP 102 Educational Psychology   | 3sh       | EDSP 102 Educational Psychology   | 3cr       |
| EDSP 477 Assessment of Student<br>Learning: Design and Interpretation of<br>Educational Measures  | 3sh       | EDSP 477 Assessment of Student<br>Learning: Design and Interpretation of<br>Educational Measures  | 3cr       |
| FDED 102 American Education in<br>Theory and Practice   | 3sh       |   |           |
|   |           | EDEX 301 Education of Students with<br>Disabilities in an Inclusive Secondary<br>Setting  | 2cr       |

a. Table Comparing "Old" And "New" Physics Education Programs Cont'd

| <b>"OLD" PHYSICS EDUCATION PROGRAM</b> |     | <b>"NEW" PHYSICS EDUCATION PROGRAM</b> |     |
|--|-----|--|-----|
| <b>Major:</b>                          |     | <b>Major:</b>                          |     |
| <b>Required Courses:</b>               |     | <b>Required Courses:</b>               |     |
| PHYS 131 Physics I-C Lecture           | 3sh | PHYS 131 Physics I-C Lecture           | 3cr |

|                                   |   |           |                                   |   |     |
|-----------------------------------|---|-----------|-----------------------------------|---|-----|
| PHYS 132                          | Physics II-C Lecture                                | 3sh       | PHYS 132                          | Physics II-C Lecture                                | 3cr |
| PHYS 131                          | Physics I-C Lab                                     | 1sh       | PHYS 131                          | Physics I-C Lab                                     | 1cr |
| PHYS 222                          | Mechanics I   | 2sh       | PHYS 222                          | Mechanics I   | 2cr |
| PHYS 223                          | Mechanics II  | 2sh       | PHYS 223                          | Mechanics II  | 2cr |
| PHYS 231                          | Electronics   | 4sh       | PHYS 231                          | Electronics   | 4cr |
| PHYS 242                          | Optics  | 3sh       | PHYS 242                          | Optics  | 3cr |
| PHYS 322                          | Electricity and Magnetism I                         | 2sh       | PHYS 322                          | Electricity and Magnetism I                         | 2cr |
| PHYS 331                          | Modern Physics                                      | 3sh       | PHYS 331                          | Modern Physics                                      | 3cr |
| PHYS 342                          | Thermal and Statistical Physics                     | 3sh       | PHYS 342                          | Thermal and Statistical Physics                     | 3cr |
| PHYS 350                          | Intermediate Experimental Physics I                 | 3sh       | PHYS 350                          | Intermediate Experimental Physics I                 | 3cr |
| <b>Controlled Electives:</b>      |   |           | <b>Controlled Electives:</b>      |   |     |
| Physics Electives                 |   | 2sh       | Physics Electives                 |   | 2cr |
| <b>Other Requirements:</b>        |   |           | <b>Other Requirements:</b>        |   |     |
| Additional Math Classes           |   | 8         | Additional Math Classes           |   | 4   |
| MATH 124                          | Calculus II for Physics, Chemistry, and Mathematics | 4sh       | MATH 124                          | Calculus II for Physics, Chemistry, and Mathematics | 4cr |
| MATH 342                          | Advanced Mathematics for Applications               | 4sh       |                                   |   |     |
| <b>Free Electives:</b>            |   | 0         | <b>Free Electives:</b>            |   | 0   |
| <b>Total Degree Requirements:</b> |   | 126-127sh | <b>Total Degree Requirements:</b> |   | 120 |

#### Old Catalog Notes

- (\*) See requirements leading to teacher certification, titled "Admission to Teacher Education," in the College of Education and Educational Technology section of this catalog.
- (1) Special Education Competency Requirement: Revision pending will eliminate exam option and will require EDEX 301 (2cr).
- (#) See advisory paragraph "Timely Completion of Degree Requirements" in the section on Requirements for Graduation.

#### New Catalog Notes

- (\*) See requirements leading to teacher certification, titled "Admission to Teacher Education," in the College of Education and Educational Technology section of this catalog.
- (#) See advisory paragraph "Timely Completion of Degree Requirements" in the section on Requirements for Graduation.

**b. List of All Associated Course Changes (new or revised courses, number, title, or description changes, and deletions)**

**Revised Courses with New Titles and New Descriptions:**

- 

**Revised Course with New Description:**

- 

**New Courses:**

- 

**Existing Course Additions:**

- EDEX 301 Education of Students with Disabilities in an Inclusive Secondary Setting
- GEOS 111 Earth Science for Educators I
- GEOS 113 Earth Science for Educators II
- BIOL 114 Environmental Biology
- BIOL 115 Biotic Diversity of North America

**Course Deletions:**

- FDED 102 American Education in Theory and Practice
- MATH 342 Advanced Mathematics for Applications
- GEOS 110 General Astronomy
- GEOS 121 Physical Geology
- GEOS 141 Introduction to Ocean Science
- GEOS 221 Physical Resources of the Earth

**3. Rationale for Changes.**

Overall, the changes are made to the B.S. in Education – Physics degree program for the following reasons: (a) to reduce the total degree requirements from 126-127sh to 120sh, (b) to upgrade the program to meet the certification requirements of the Pennsylvania Department of Education, (c) to eliminate course designations no longer offered, and (d) to include coursework specifically designed for education majors and to meet the standards of the Pennsylvania Department of Education and NCATE.

The rationale for each specific type of change is described below.

**Existing Course Additions:**

EDEX 301 Education of Students with Disabilities in an Inclusive Secondary Setting (2sh) is added to satisfy the mandate by the Pennsylvania Department of Education that all certified Education Majors learn the relevant educational aspects of the inclusion of challenged students into the classroom.

GEOS 111 Earth Science for Educators I (3cr) is specifically designed for Education Majors to meet the Pennsylvania Department of Education Standards described in Pennsylvania Code, Chapter 4, “Academic Standards for Science, Physics Education” in the context of oceanography and geology. It gives the student the option to choose to study the field of geology that they may apply in their instruction and to meet the Pennsylvania Standards.

GEOS 113 Earth Science for Educators II (3cr) is specifically designed for Education Majors to meet the Pennsylvania Department of Education Standards described in Pennsylvania Code,

Chapter 4, "Academic Standards for Science, Physics Education" in the context of meteorology and astronomy. It gives the student the option to choose to study the field of geology that they may apply in their instruction and to meet the Pennsylvania Standards.

BIOL 114 Environmental Biology (3cr) gives the opportunity to Education Majors to learn the aspects of Biology that may be of current interest to students in public schools and to satisfy the Pennsylvania Department of Education Standards described in Pennsylvania Code, Chapter 4 Academic Standards for Science, Physics Education in the context of environmental science.

BIOL 115 Biotic Diversity of North America (3cr) gives the opportunity to Education Majors to learn the aspects of Biology that are of current interest to students in public schools and to satisfy the Pennsylvania Department of Education Standards described in Pennsylvania Code, Chapter 4, "Academic Standards for Science, Physics Education" in the context of the biological diversity in aquatic and terrestrial biomes of North America.

#### **Course Deletions:**

FDED 102 American Education in Theory and Practice (3cr) is deleted because (1) the content of this course is covered in the methods courses for the science education majors (2) the Pennsylvania Department of Education no longer requires that candidates for certification take this course. (3) The College of Education no longer requires that this course be taken by education majors.

MATH 342 Advanced Mathematics for Applications (4cr) is being deleted to meet the Pennsylvania State requirement to reduce the total number of credit hours to a minimum of 120 credit hours. It is a course which gives the student added mathematical expertise required in higher level physics coursework, but that is not essential to the physics coursework in our present program and its content is not required to satisfy the Pennsylvania Department of Education Standards described in Pennsylvania Code, Chapter 4, "Academic Standards for Science, Physics Education".

GEOS 110 General Astronomy (3cr) is being deleted because it is no longer offered by the IUP Geo-science Department.

GEOS 121 Physical Geology (3cr) is being deleted and will be replaced by GEOS 111 (3cr) or 113 (3cr).

These courses more nearly conform to the standards expected by the Pennsylvania Department of Education and NCATE.

GEOS 141 Introduction to Ocean Science (3cr) is being deleted and will be replaced by GEOS 111 or 113. These courses more nearly conform to the standards expected by the Pennsylvania Department of Education and NCATE.

GEOS 221 Physical Resources of the Earth (3cr) is being deleted and will be replaced by GEOS 111 or 113. These courses more nearly conform to the standards expected by the Pennsylvania Department of Education and NCATE.

### **Part III. Implementation**

#### **1. How the Revisions will Affect Students Already in the Existing Physics Education Program.**

The new B.S. in Education – Physics degree program is expected to start in Fall 2003. Students already in the existing degree program will not be affected by these changes because they still will be able to follow the degree requirements that were in effect during their entry to the program.

## **2. How the Proposed Revisions will Affect Faculty Teaching Loads.**

The proposed revisions are not expected to affect the faculty teaching loads. Presently, the number of students in Physics Education is small. There are presently a total 16 physics education majors enrolled at IUP and therefore any change in the degree requirements will have minimal impact in the classes affected.

## **3. Adequacy of Other Resources.**

Other resources (space, equipment, supplies, travel funds) are expected to be adequate.

## **4. Expectation of an Increase or Decrease in the Number of Students as a Result of These Revisions.**

No increase or decrease in the number of Physics Education students is expected as a result of these revisions.

## **Part IV. Periodic Assessment**

The B.S. in Education – Physics degree program is evaluated regularly by the Coordinator of this degree program, the Physics Department Curriculum Committee, the Physics Department faculty, and the Physics Education majors. The Coordinator is responsible for ensuring that the Physics Education Degree Program meets the standards of our Learned Society, which is the National Science Teachers Association (NSTA), and the Pennsylvania Department of Education. Every five years a detailed report is compiled for the National Council for Accreditation of Teacher Education (NCATE) and the Pennsylvania Department of Education (PDE) for these agencies to evaluate the program.

Periodically, feedback is obtained from the Physics faculty and the Cooperating Teachers of our student teachers, especially when deficiencies in the program are found. This feedback has been utilized in past revisions to the coursework in this program. For example, the demonstrations in PHYS 131 and 132 have been enhanced.

Physics Education majors evaluate the program at the end of their student teaching experience on Professional Day by completing different program assessment surveys. The first is the *ETS-Program Self-Assessment Service* survey administered by the College of Education. The *Physics Education Student Teaching Exit Survey* and the *Science Student Teaching Exit Survey* is administered by the coordinator of the science education methods courses. See Appendix A for an example of the items on the *ETS-Program Self-Assessment Service* survey, the *Physics Education Program Student Evaluation* survey and the *Science Student Teaching Exit Survey*.

## **Part V. Course Proposals**

There are no new or revised courses in this curriculum proposal.

The following letters of support is part of this package. (See Appendix B.)

- A. Dr. Gary Stoudt Chairman of the Mathematics Department
- B. Dr. Darlene Richardson, Chairman of the Geoscience Department
- C. Dr. John Butzow, Dean of the College of Education
- D. Dr. Joseph Domaracki, Chairman of the Department of Special Education and clinical Services
- E. Dr. Carl Luciano, Chairman of the Biology Department



A. While the Mathematics Department feels that the material in MATH 342 Advanced Mathematics for Applications is ideally suited for physics majors of all kinds, we also understand the difficulties involved in meeting the 120 credit mandate, and therefore we will support the removal of MATH 342 from the list of requirements for a BSEd in Physics Education. We hope that students will still be encouraged to take the course.

Gary Stoudt, Chairperson  
Mathematics

B. Hi, Ken. Geoscience does not have a problem with your proposal. I just want to let you know that we plan to offer GEOS 111 and GEOS 113 during alternate Fall semesters instead of Fall (GEOS 111) and Spring (GEOS 113) as we do now. Since your students will take either, this Fall only offering of GEOS 111 and GEOS 113 should not impose a registration hardship on your students. Darlene

----- Original Message -----

**From:** Ken Hershman

**To:** Darlene Richardson

**Cc:** Ken Hershman

**Sent:** Thursday, January 16, 2003 12:49 PM

**Subject:** Program Revision in Physics Education

Darlene,

In our attempt to meet the 120 mandate we are proposing to change the list of controlled Liberal Studies Electives in our BS in Education - Physics degree requirements to delete "GEOS 110, or 121, or 141 or 222" and to add "GEOS 111 or GEOS 113". This change is in part due to the fact that you no longer offer GEOS 110 and have generated GEOS 111 and GEOS 113 specifically for education students.

Since all these courses are 3 credit courses this will not alter our total GEOS credit requirement and since we only have a total of 16 physics education majors enrolled at IUP, this change should have minimal effect on your course enrollments or faculty loads.

Your input to this proposal is welcome.

Ken

C. This has already been done by the University Senate for all programs so I am not sure he needs to comment.

John

----- Original Message -----

**From:** Ken Hershman

**To:** efft@iup.edu

**Cc:** John Butzow

**Sent:** Thursday, January 16, 2003 3:22 PM

**Subject:** Revision of the Physics Education Program

Dr. Thibadeau,

I regret to inform you that the Physics Department is proposing to delete from our program the College Requirement of FDED 102 in order to meet the 120 mandate. Since we only have a total of 16 physics education majors enrolled at IUP, this change should have minimal effect on your enrollments or faculty loads.

Your input to this proposal is welcome.

Dr. Hershman

Chairman,

IUP Physics Department

Ken,

D. Sounds good to me. I don't see any problem with your proposal and it will not effect us in any way.

Joe

Ken Hershman wrote:

Joe, The impetus has been created with the 120 mandate to delete FDED 102 and to finally add EDEX 301 to the BS in Education - Physics Degree. We are proposing to add EDEX 301 to satisfy the directive from PDE and from Dr. Butzow. Since we only have a total of 16 physics education majors enrolled at IUP, this change should have minimal effect on your enrollments or faculty loads. Your input to this proposal is welcome. Ken

E.  
Ken

That arrangement should be fine. Perhaps we can interest a faculty member in offering the 114 course. CL

----- Original Message -----

**From:** Ken Hershman

**To:** Dr. Carl Luciano

**Sent:** Monday, January 20, 2003 1:16 PM

**Subject:** Physics Ed Liberal Studies Elective change to meet 120 mandate

Carl,

You had indicated that BIOL 114 was taught infrequently, so I asked Terry Peard which 3 credit courses came nearest to meeting our standards. He indicated to me that BIOL 103, 114, & 115 come nearest to meeting the PDE and NCATE standards for Science Ed. majors.

Therefore we now propose to change our present Biology requirement of "BIOL 103" to "BIOL 103, or BIOL 114 or BIOL" 115". By doing so we can show a decrease of "1sh" in total toward the 120 goal.

We retained the BIOL 114 with the idea that it might be useable if and when you do offer it.

Could you email me a response to this proposal.

Thanks,

Ken Hershman

## **APPENDIX A**

### **Program Evaluation Instruments**

#### **ETS-Program Self-Assessment Service Survey Physics Education Student Teaching Exit Survey Questionnaire – Science Student Teaching Exit Survey**

#### **PHYSICS EDUCATION STUDENT TEACHING EXIT SURVEY**

Directions: In an ongoing effort to ensure our physics teacher preparation program continues to prepare outstanding physics teachers who are appropriately prepared to meet the demands of the public schools, please respond to the following questions. Give careful consideration to provide us with as much useful information as possible. Be frank and honest in your assessments. Please note that this form is being completed anonymously.

1. From your perspective, please rate the usefulness of the content in the in the major following required courses in preparing you to meet the standards of the Pennsylvania Department of Education and to teach Physics in secondary schools. (NA = not applicable, 5 = very useful, 1 = not useful)

|                     |                                     |    |   |   |   |   |   | COMMENTS |
|---------------------|-------------------------------------|----|---|---|---|---|---|----------|
| PHYS 131            | Physics I-C Lecture                 | NA | 5 | 4 | 3 | 2 | 1 |          |
| PHYS 132            | Physics II-C Lecture                | NA | 5 | 4 | 3 | 2 | 1 |          |
| PHYS 141            | Physics I-C Lab                     | NA | 5 | 4 | 3 | 2 | 1 |          |
| PHYS 142            | Physics II-C Lab                    | NA | 5 | 4 | 3 | 2 | 1 |          |
| PHYS 222            | Mechanics I                         | NA | 5 | 4 | 3 | 2 | 1 |          |
| PHYS 223            | Mechanics II                        | NA | 5 | 4 | 3 | 2 | 1 |          |
| PHYS 231            | Electronics                         | NA | 5 | 4 | 3 | 2 | 1 |          |
| PHYS 242            | Optics                              | NA | 5 | 4 | 3 | 2 | 1 |          |
| PHYS 322            | Electricity and Magnetism I         | NA | 5 | 4 | 3 | 2 | 1 |          |
| PHYS 331            | Modern Physics                      | NA | 5 | 4 | 3 | 2 | 1 |          |
| PHYS 342            | Thermal and Statistical Physics     | NA | 5 | 4 | 3 | 2 | 1 |          |
| PHYS 350            | Intermediate Experimental Physics I | NA | 5 | 4 | 3 | 2 | 1 |          |
| PHYS Elective _____ |                                     | NA | 5 | 4 | 3 | 2 | 1 |          |

2. Similarly, please rate the usefulness of the following courses in controlled electives courses in preparing you to meet the standards of the Pennsylvania Department of Education and to teach Physics in secondary schools. (NA = not applicable, 5 = very worthwhile, 1 = not useful)

|           |  |    |   |   |   |   |   | COMMENTS |
|-----------|--|----|---|---|---|---|---|----------|
| CHEM 111  |  | NA | 5 | 4 | 3 | 2 | 1 |          |
| CHEM 112  |  | NA | 5 | 4 | 3 | 2 | 1 |          |
| PSYC 101  |  | NA | 5 | 4 | 3 | 2 | 1 |          |
| MATH 241  |  | NA | 5 | 4 | 3 | 2 | 1 |          |
| BIOL 103  |  | NA | 5 | 4 | 3 | 2 | 1 |          |
| BIOL 114, |  | NA | 5 | 4 | 3 | 2 | 1 |          |
| BIOL 115, |  | NA | 5 | 4 | 3 | 2 | 1 |          |
| GEOS 111  |  | NA | 5 | 4 | 3 | 2 | 1 |          |

GEOS113. NA 5 4 3 2 1

3. Similarly, please rate the usefulness of the following courses in the College of Education courses in preparing you to meet the standards of the Pennsylvania Department of Education and to teach Physics in secondary schools..

(NA = not applicable, 5 = very worthwhile, I = not useful)

|          |                                   |    |   |   |   |   |   |
|----------|-----------------------------------|----|---|---|---|---|---|
| EDUC 242 | Pre Student Teaching I            | NA | 5 | 4 | 3 | 2 | 1 |
| EDUC 342 | Pre Student Teaching II           | NA | 5 | 4 | 3 | 2 | 1 |
| COMM 103 | Instructional Media               | NA | 5 | 4 | 3 | 2 | 1 |
| EDUC 441 | Student Teaching                  | NA | 5 | 4 | 3 | 2 | 1 |
| EDUC 442 | School Law                        | NA | 5 | 4 | 3 | 2 | 1 |
| EDUC 451 | Teaching Sci. in the Sec. Schools | NA | 5 | 4 | 3 | 2 | 1 |
| EDEX 301 | Ed. of Students with Disabilities | NA | 5 | 4 | 3 | 2 | 1 |
| EDSP 477 | Assessment of Student Learning    | NA | 5 | 4 | 3 | 2 | 1 |

4. Has the IUP Physics Education program including Student Teaching adequately prepared you to teach physics in the public schools? If you do not feel adequately prepared, please explain why.

5. Please cite the strengths of the Physics Education program at IUP.

6. Please cite the weaknesses of the Physics Education Program at IUP.

7. If you could make changes in the Physics Education program at IUP, what would they be? Please explain your reasoning.

8. To what degree do you feel that the Physics Education program at IUP has prepared you to meet the following NSTA Standards?  
 (4 = Strongly Prepared, 1 = No Preparation)

|   | Strongly Prepared |   |   | No Prep: |
|---|-------------------|---|---|----------|
| Know and understand the major concepts and principles of Physics.   | 4                 | 3 | 2 | 1        |
| Know and understand the major concepts and principles unifying science disciplines.                               | 4                 | 3 | 2 | 1        |
| Design, conduct, and report investigations within a science discipline.   | 4                 | 3 | 2 | 1        |
| Apply mathematics in problem-solving and scientific investigation.  | 4                 | 3 | 2 | 1        |
| Know and understand the philosophical nature of science and the conventions of scientific explanation.            | 4                 | 3 | 2 | 1        |
| Engage K-12 students effectively in studies of the nature of science and conventions of scientific explanation.   | 4                 | 3 | 2 | 1        |
| Know and understand scientific inquiry and its relationship to the development of scientific knowledge.           | 4                 | 3 | 2 | 1        |
| Engage K-12 students effectively in scientific inquiry appropriate for their grade level and abilities.           | 4                 | 3 | 2 | 1        |
| Know and understand the relationship of science to other human values and endeavors.                              | 4                 | 3 | 2 | 1        |
| Engage K-12 students effectively in the study of the relationship of science to other human values and endeavors. | 4                 | 3 | 2 | 1        |
| Relate science to the personal lives, needs and interests of K-12 students.                                       | 4                 | 3 | 2 | 1        |
| Use diverse and effective actions, strategies and methodologies to teach science.                                 | 4                 | 3 | 2 | 1        |
| Interact effectively with K-12 students to promote learning and demonstrate student achievement.                  | 4                 | 3 | 2 | 1        |
| Organize and manage science activities effectively in different student groupings.                                | 4                 | 3 | 2 | 1        |
| Use advanced technology to teach K-12 students science.   | 4                 | 3 | 2 | 1        |

|  |   |   |   |   |
|--|---|---|---|---|
| Use prior conceptions and K-12 student interests to promote learning.  | 4 | 3 | 2 | 1 |
| Develop coherent, meaningful goals, plans, and materials and find resources.   | 4 | 3 | 2 | 1 |
| Relate plans and resources to professionally-developed state and national standards, including the National Science Education Standards. | 4 | 3 | 2 | 1 |
| Plan and develop science curriculum addressing the needs, interests, and abilities of all preK-12 students.                              | 4 | 3 | 2 | 1 |
| Know and understand the values and needs of the community and their effect on the teaching and learning of science.                      | 4 | 3 | 2 | 1 |
| Use community, human, and institutional resources to advance the learning of science in the classroom and field.                         | 4 | 3 | 2 | 1 |
| Align science goals, instruction, and outcomes.  | 4 | 3 | 2 | 1 |

|   | Strongly Prepared |   |   | No Prep: |
|---|-------------------|---|---|----------|
|   | 4                 | 3 | 2 | 1        |
| Know and use a variety of contemporary science assessment strategies to determine preK-12 student needs and levels of learning and development. | 4                 | 3 | 2 | 1        |
| Use assessment appropriately to determine, guide and change science instruction.  | 4                 | 3 | 2 | 1        |
| Create and maintain a psychologically and socially safe and supportive learning environment.  | 4                 | 3 | 2 | 1        |
| Manage the activities and materials of science safely in storage areas, labs, and field.  | 4                 | 3 | 2 | 1        |
| Keep and use living organisms in the classroom in a safe, ethical, and appropriate manner.  | 4                 | 3 | 2 | 1        |
| Know and participate in professional organizations and activities of the science education community beyond the classroom.                      | 4                 | 3 | 2 | 1        |
| Behave ethically and in the best interests of pre-K-12 students and the community.  | 4                 | 3 | 2 | 1        |
| Engage in reflective practices and make continuous efforts to improve in practice.  | 4                 | 3 | 2 | 1        |
| Work willingly with peers, supervisors, and others in a professional manner.  | 4                 | 3 | 2 | 1        |

9. To what degree do you feel that the Physics Education program at IUP has prepared you to attain the following content knowledge?  
(4 = Strongly Prepared, 1 = No Preparation)

|  | Strongly Prepared |   |   | No Prep: |
|--|-------------------|---|---|----------|
|  | 4                 | 3 | 2 | 1        |
| Basic principles of mathematics as they relate to physics    | 4                 | 3 | 2 | 1        |
| Basic principles of chemistry as they relate to physics      | 4                 | 3 | 2 | 1        |
| Relationships between matter and energy (Conversion between) | 4                 | 3 | 2 | 1        |
| Physical parameters, units, and dimensional analysis         | 4                 | 3 | 2 | 1        |
| Error analysis   | 4                 | 3 | 2 | 1        |



|  | Strongly Prepared |   |   | No Prep: |
|--|-------------------|---|---|----------|
| The study of motion (kinematics)   | 4                 | 3 | 2 | 1        |
| Kinetic-molecular theory   | 4                 | 3 | 2 | 1        |
| Application of physics to the life sciences                                  | 4                 | 3 | 2 | 1        |
| Application of physics to the earth sciences                                 | 4                 | 3 | 2 | 1        |
| Application of physics to scientific discovery and technological advancement | 4                 | 3 | 2 | 1        |
| Newton's Laws  | 4                 | 3 | 2 | 1        |
| Momentum and collisions  | 4                 | 3 | 2 | 1        |
| Mechanical waves - sound   | 4                 | 3 | 2 | 1        |
| Thermal properties of matter   | 4                 | 3 | 2 | 1        |
| Static electricity   | 4                 | 3 | 2 | 1        |
| AC and DC Current electricity  | 4                 | 3 | 2 | 1        |
| Optics of reflection and refraction applied to lenses and mirrors            | 4                 | 3 | 2 | 1        |
| Interference and Diffraction   | 4                 | 3 | 2 | 1        |
| Special Relativity   | 4                 | 3 | 2 | 1        |
| Radioactivity  | 4                 | 3 | 2 | 1        |
| Closed and open systems  | 4                 | 3 | 2 | 1        |
| Conservation Laws  | 4                 | 3 | 2 | 1        |
| Simple Harmonic Motion and Vibrations  | 4                 | 3 | 2 | 1        |
| Damping  | 4                 | 3 | 2 | 1        |
| Feedback   | 4                 | 3 | 2 | 1        |
| Kirchoff laws  | 4                 | 3 | 2 | 1        |
| Capacitance  | 4                 | 3 | 2 | 1        |

|  | Strongly Prepared |   |   | No Prep: |
|--|-------------------|---|---|----------|
|  | 4                 | 3 | 2 | 1        |
| Electric and Magnetic Induction                | 4                 | 3 | 2 | 1        |
| Electric and Magnetic field strength           | 4                 | 3 | 2 | 1        |
| Electric Potential (voltage)                   | 4                 | 3 | 2 | 1        |
| Faraday's Law                                  | 4                 | 3 | 2 | 1        |
| Bio-Savart Law                                 | 4                 | 3 | 2 | 1        |
| Resonance                                      | 4                 | 3 | 2 | 1        |
| Diodes and triodes                             | 4                 | 3 | 2 | 1        |
| Operational amplifiers                         | 4                 | 3 | 2 | 1        |
| Light and electromagnetic waves                | 4                 | 3 | 2 | 1        |
| Bohr Theory                                    | 4                 | 3 | 2 | 1        |
| Rutherford scattering                          | 4                 | 3 | 2 | 1        |
| Spectroscopy                                   | 4                 | 3 | 2 | 1        |
| Laws of thermodynamics - heat engines          | 4                 | 3 | 2 | 1        |
| Photo electric effect                          | 4                 | 3 | 2 | 1        |
| Stimulated emission of radiation               | 4                 | 3 | 2 | 1        |
| Experimental design                            | 4                 | 3 | 2 | 1        |
| Data collection                                | 4                 | 3 | 2 | 1        |
| Data analysis and interpretation               | 4                 | 3 | 2 | 1        |
| Nuclear Power                                  | 4                 | 3 | 2 | 1        |
| Laboratory safety                              | 4                 | 3 | 2 | 1        |
| Ethical implications of science and technology | 4                 | 3 | 2 | 1        |
| History of physics                             | 4                 | 3 | 2 | 1        |

|  | 4 | 3 | 2 | 1 |
|--|---|---|---|---|
| Safety of household products, and equipment        | 4 | 3 | 2 | 1 |
| Exponential Decay                                  | 4 | 3 | 2 | 1 |
| Ohm's Law, Equivalent Circuits, Thevenin's Theorem | 4 | 3 | 2 | 1 |

10. Please provide any additional information that you think would be useful to ensure that our physics teacher preparation program continues to prepare outstanding physics teachers who are adequately prepared to meet the demands of the public schools.

**THANK YOU. YOUR INPUT WILL BE USED IN ANY REVISIONS OF THE CURRICULUM FOR THE PHYSICS EDUCATION PROGRAM**

ETS-Program Self-Assessment Service  
 Summary Data Report  
 June 21, 2002 - For Spring Semester 2002 IUP Student Teachers  
 Revised 6-27-02

| Sale Description/Items   | IUP Mean    | U.S. Mean   |
|--|-------------|-------------|
| <b>1. Environment for Learning</b>   | <b>3.23</b> | <b>3.07</b> |
| I-2 Different Scholarly Points Of View are Encouraged                          | 3.15        | 3.03        |
| I-4 Dept. Has Human Environment, Mutual Respect Between Students and Faculty   | 3.27        | 3.21        |
| I-7 Majors Tend to Support And Help Each Other Meet Acad. Demands Of Program   | 3.44        | 3.22        |
| I -13 Members Of Department Work Together To Achieve Program Goals             | 3.18        | 3.03        |
| I -14 Department Is Receptive To New Ideas And Ways Of Doing Things            | 3.10        | 2.86        |
| <b>2. Scholarly Excellence</b>   | <b>3.23</b> | <b>3.06</b> |
| I -3 The Program Is Academically Demanding For Most Students                   | 3.32        | 3.30        |
| I -8 Department Is An Academically Stimulating Place For Understanding         | 3.27        | 3.01        |
| II -1 Intellectual Environment   | 3.23        | 2.96        |
| II -8 Scholarly And Professional Competency Of Undergraduate Faculty           | 3.21        | 3.15        |
| II -10 Academic Ability And Prep. Of Students Majoring In Program/Dept.        | 3.12        | 2.89        |
| <b>3. Quality Of Teaching</b>  | <b>3.14</b> | <b>2.98</b> |
| I -10 Most Faculty Members Prepare Carefully For Their Courses                 | 3.16        | 3.19        |
| II -13 Appropriateness of Procedures Used To Evaluate Students                 | 3.16        | 2.88        |
| II -14 Teaching Methods Used In Dept. Courses                                  | 3.08        | 2.94        |
| II -22 Useful Faculty Criticism Of Your Work                                   | 3.12        | 2.85        |
| II -23 Faculty Helpfulness In Dealing With Classwork                           | 3.13        | 2.97        |
| II -24 Faculty Awareness Of New Developments In The Field                      | 3.21        | 3.08        |
| <b>4. Faculty Concern For Students</b>   | <b>3.09</b> | <b>2.98</b> |
| I -1 Most Faculty Genuinely Interested In Dept. Majors' Welfare & Prof. Devlp. | 3.43        | 3.30        |
| I -15 Good Communication Between Fac. & Stud. Regarding Students Needs         | 3.00        | 2.94        |
| I -16 Many Opportunities Outside Classroom For Interaction (Majors/Faculty)    | 2.92        | 2.73        |
| II -15 Accessibility Of Faculty Members To Undergraduate Majors                | 3.03        | 2.95        |
| <b>5. Curriculum</b>   | <b>2.95</b> | <b>2.57</b> |
| II -9 Frequency With Which Courses Required For The Degree Are Offered         | 3.00        | 2.48        |
| II -16 Variety Of Advanced Course And Program Offerings                        | 2.97        | 2.57        |
| II -17 Depth In Subject Matter Of Advanced Course And Program Offerings        | 3.05        | 2.77        |
| II -18 Flexibility Of Prog. To Meet The Needs Of Individual Undergrad. Majors  | 2.93        | 2.56        |
| II -19 Opportunities For Departmental Majors to Pursue Individual Projects     | 2.87        | 2.57        |
| II -25 Interaction B/W Dept. & Related Disciplines Or Programs On Campus       | 2.95        | 2.52        |
| <b>6. Departmental Procedures</b>  | <b>2.94</b> | <b>2.74</b> |
| I -9 Dept. Actively Helps Its Grads. Find Appropriate Emplmnt/ Pursue Study    | 3.00        | 2.85        |
| II -2 Curricular And Career Advising   | 2.77        | 2.66        |
| II -3 Agreement B/W Degree Requirements & Stated Objectives of Program         | 3.03        | 2.91        |
| II -4 Clarity Of Degree Requirements   | 2.90        | 2.92        |
| II -11 Opportunities For Student Participation In Dept. Affecting The Program  | 2.64        | 2.16        |
| II -12 Relevance Of Degree Reqmts To Students' Anticipated Work/Study          | 3.11        | 2.86        |
| II -20 Opportunities For Formal Student Evaluation Of Courses & Instructions   | 3.16        | 2.78        |
| <b>7. Available Resources</b>  | <b>2.89</b> | <b>2.64</b> |
| II -5 Library Holdings Relevant To The Field                                   | 2.55        | 2.58        |
| II -6 Laboratories, Studios, & Equip. Needed For Teaching & Creative Work      | 2.76        | 2.65        |

ETS-Program Self-Assessment Continued:

|   |             |             |
|---|-------------|-------------|
| II -7 Overall Adequacy Of Space & Other Facilities For Classes & Admin              | 2.85        | 2.71        |
| II -21 Institution's Commitment To The Program                                      | 3.19        | 2.90        |
| II -26 Overall Adequacy Of Financial Resources In Support of Program/Dept.          | 2.84        | 2.36        |
| II -27 # Of Support & Clerical Staff in Program/Department                          | 2.95        | 2.50        |
| II -28 Quality Of Support And Clerical Staff  | 3.04        | 2.74        |
| <b>8. Student Satisfaction With Program</b>   | <b>3.46</b> | <b>3.26</b> |
| I -5 I Have Learned A Great Deal As A Major In This Dept./Program                   | 3.56        | 3.36        |
| I -6 I Would Advise A Friend With Similar Interests To Major In This Dept./Prog     | 3.05        | 3.25        |
| I -11 If I Were Starting Over, I Would Enroll In This Dept./Program                 | 3.42        | 3.19        |
| I -12 Dept. Provides Very Good Preparation For Future Prof. Work/Advanced Study     | 3.36        | 3.23        |
| <b>9. Internship, Fieldwork, Or Clinical Experiences</b>                            | <b>3.40</b> | <b>3.11</b> |
| III -2 Departmental Training To Prepare You For The Experience                      | 3.34        | 2.97        |
| III -3 Contribution Of The Experience To Your Academic Development                  | 3.62        | 3.32        |
| III -4 Chance To Develop Your Professional Skills                                   | 3.68        | 3.32        |
| III -5 Variety Of Assignments Or Activities   | 3.47        | 3.11        |
| III -6 Supervision you Received   | 3.27        | 3.11        |
| III -7 Office Space And Equipment Available For Your Use                            | 3.04        | 2.84        |
| <b>10. Resource Accessibility</b>   | <b>2.96</b> | <b>2.59</b> |
| II -29 Availability Of Student Services   | 2.97        | 2.67        |
| II -30 Availability Of Student Financial Assistance                                 | 2.85        | 2.43        |
| II -31 Opportunities For Intellectual And Social Interaction Among Persons in Prog. | 3.08        | 2.66        |

QUESTIONNAIRE - SCIENCE STUDENT TEACHING EXIT MEETING

What is your major: \_\_\_\_\_

Directions: In an ongoing effort to ensure our teacher preparation program continues to prepare outstanding science teachers who are appropriately prepared to meet the demands of the public schools, we are asking you to respond to the following questions. Please give careful consideration to providing us with as much useful information as possible, Be frank and honest in your assessments. Please note this form is being completed anonymously.

1. Please relate the usefulness of the following student teaching experience assignments.

(NA = not applicable, 5 = very worthwhile, 1 = useless)

|    |                              |    |   |   |   |   |   | COMMENTS |
|----|------------------------------|----|---|---|---|---|---|----------|
| a. | entry level survey           | NA | 5 | 4 | 3 | 2 | 1 |          |
| b. | one week observation reports | NA | 5 | 4 | 3 | 2 | 1 |          |
| c. | weekly goal sheet            | NA | 5 | 4 | 3 | 2 | 1 |          |
| d. | bulletin boards/displays     | NA | 5 | 4 | 3 | 2 | 1 |          |
| c. | observation of others        | NA | 5 | 4 | 3 | 2 | 1 |          |

|                             |    |   |   |   |   |   |
|-----------------------------|----|---|---|---|---|---|
| f. unit plan                | NA | 5 | 4 | 3 | 2 | 1 |
| g. lunch duty               | NA | 5 | 4 | 3 | 2 | 1 |
| h. bus duty                 | NA | 5 | 4 | 3 | 2 | 1 |
| i. study hall               | NA | 5 | 4 | 3 | 2 | 1 |
| j. videotaped lesson        | NA | 5 | 4 | 3 | 2 | 1 |
| k. club/activity            | NA | 5 | 4 | 3 | 2 | 1 |
| l. professional readings    | NA | 5 | 4 | 3 | 2 | 1 |
| m. professional days at IUP | NA | 5 | 4 | 3 | 2 | 1 |
| n. special needs students   | NA | 5 | 4 | 3 | 2 | 1 |
| o. daily lesson plans       | NA | 5 | 4 | 3 | 2 | 1 |

2. What other activities, if any, should be added to the above list for a well-rounded student teaching experience?

3. In the light of your student teaching experience, has your academic program at WP adequately prepared you to teach your subject area in the public schools? Please cite strengths and weaknesses.

4. If you could make changes in the student teaching experience/procedures, what would they be? Explain your suggestions.

5. What suggestions do you have for the university supervisors which would help them be more effective and/or helpful?

6. If you could make changes in the pre-clinical experience courses, what would they be? Please explain your reasoning.

7. Do you feel the content of the other education courses in our program (i.e., Assessment of Student Learning, Digital Instructional Technology, etc.) is appropriate and useful to you? What changes would you suggest? Are there other education courses that would better serve you as student teacher and a teacher?

8. Did your Cooperating Teacher provide encouragement and support throughout your student teaching experience? Please explain.

9. Do you now feel prepared to "go get a job"? About what are you most concerned? Explain.

To what degree do you feel that the present curriculum for Methods of Teaching Science has prepared you for the following experiences:

|                               | Strongly Prepared |   |   | No Preparation |
|-------------------------------|-------------------|---|---|----------------|
| Lesson plan preparation       | 4                 | 3 | 2 | 1              |
| Use of demonstrations         | 4                 | 3 | 2 | 1              |
| Discipline problems           | 4                 | 3 | 2 | 1              |
| Laboratory safety             | 4                 | 3 | 2 | 1              |
| Lecture/discussion techniques | 4                 | 3 | 2 | 1              |
| Motivation techniques         | 4                 | 3 | 2 | 1              |
| Selecting textbooks           | 4                 | 3 | 2 | 1              |
| Cooperative Learning          | 4                 | 3 | 2 | 1              |
| Conducting labs               | 4                 | 3 | 2 | 1              |
| Test questions                | 4                 | 3 | 2 | 1              |
| Test construction             | 4                 | 3 | 2 | 1              |
| Growing professionally        | 4                 | 3 | 2 | 1              |
| Preparation of objectives     | 4                 | 3 | 2 | 1              |

|  |   |   |   |   |
|--|---|---|---|---|
| Lesson presentations                     | 4 | 3 | 2 | 1 |
| Using computers in science teaching      | 4 | 3 | 2 | 1 |
| Inquiry teaching                         | 4 | 3 | 2 | 1 |
| Special needs for special students       | 4 | 3 | 2 | 1 |
| Ordering/managing materials              | 4 | 3 | 2 | 1 |
| Field trips                              | 4 | 3 | 2 | 1 |
| Competitions/Contests/Science Fairs      | 4 | 3 | 2 | 1 |
| Other areas not listed: (please fill in) | 4 | 3 | 2 | 1 |

YOUR INPUT WILL BE USED IN ANY REVISIONS OF THE CURRICULUM FOR METHODS.

1. Based on your student teaching experience, a revision of the curriculum for Methods should definitely include the following topics:

|   | Strongly Agree |   | Strongly Disagree |   |
|---|----------------|---|-------------------|---|
| Unit plan preparation                   | 4              | 3 | 2                 | 1 |
| Lesson plan preparation                 | 4              | 3 | 2                 | 1 |
| Use of demonstrations                   | 4              | 3 | 2                 | 1 |
| Discipline problems                     | 4              | 3 | 2                 | 1 |
| Laboratory safety                       | 4              | 3 | 2                 | 1 |
| Lecture/discussion techniques           | 4              | 3 | 2                 | 1 |
| Motivation techniques                   | 4              | 3 | 2                 | 1 |
| Selecting textbooks                     | 4              | 3 | 2                 | 1 |
| Cooperative learning                    | 4              | 3 | 2                 | 1 |
| Conducting labs                         | 4              | 3 | 2                 | 1 |
| Test questions                          | 4              | 3 | 2                 | 1 |
| Test construction                       | 4              | 3 | 2                 | 1 |
| Growing professionally                  | 4              | 3 | 2                 | 1 |
| Preparation of objectives               | 4              | 3 | 2                 | 1 |
| Lesson presentations                    | 4              | 3 | 2                 | 1 |
| Using computers in science teaching     | 4              | 3 | 2                 | 1 |
| Inquiry teaching                        | 4              | 3 | 2                 | 1 |
| Special needs for special students      | 4              | 3 | 2                 | 1 |
| Ordering/Managing materials             | 4              | 3 | 2                 | 1 |
| Field trips                             | 4              | 3 | 2                 | 1 |
| Competitions/Contests/Science Fairs     | 4              | 3 | 2                 | 1 |
| Guest speakers                          | 4              | 3 | 2                 | 1 |
| Other areas no listed: (please fill in) | 4              | 3 | 2                 | 1 |

In your opinion, if you were to select units of material to include in the METHODS curriculum, based on your student teaching experience, how would you rate their importance:

- 1 - Must have a working knowledge of the item
- 2 - Should be exposed to the term
- 3 - Nice to discuss the item if time permits



- \_\_\_\_\_ Unit plan preparation
- \_\_\_\_\_ Lesson plan preparation
- \_\_\_\_\_ Use of demonstrations
- \_\_\_\_\_ Discipline problems
- \_\_\_\_\_ Laboratory safety
- \_\_\_\_\_ Lecture/Discussion techniques

1- Must have a working knowledge of the item

2- Should be exposed to the item

3 - Nice to discuss the item if time permits

- \_\_\_\_\_ Motivation techniques
- \_\_\_\_\_ Selecting textbooks
- \_\_\_\_\_ Cooperative learning
- \_\_\_\_\_ Conducting labs
- \_\_\_\_\_ Test questions
- \_\_\_\_\_ Test construction
- \_\_\_\_\_ Growing professionally
- \_\_\_\_\_ Preparation of course objectives
- \_\_\_\_\_ Lesson presentations
- \_\_\_\_\_ Using computers in science teaching
- \_\_\_\_\_ Inquiry teaching
- \_\_\_\_\_ Special needs for special students
- \_\_\_\_\_ Ordering/Managing materials
- \_\_\_\_\_ Field trips
- \_\_\_\_\_ Competitions/Contests/Science Fairs
- \_\_\_\_\_ Other ones not listed (fill in)
- \_\_\_\_\_ \_\_\_\_\_
- \_\_\_\_\_ \_\_\_\_\_
- \_\_\_\_\_ \_\_\_\_\_
- \_\_\_\_\_ \_\_\_\_\_