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PROGRAM ADMISSION

ADMISSION TO GRADUATE STUDY AT UNI

Before being admitted to the Science Education Graduate program, one must first be admitted to graduate study at the University. The minimum bachelor’s degree grade point average (GPA) for admission is 3.00. Students with a GPA of 2.75-2.99 may be admitted on a provisional status depending on indicators of academic potential. The Graduate Records Exam (GRE) is NOT required.

Complete the Application to Graduate Study specifying degree choice and “major code” on the application:

- MA Science Education (major code = 821),
- MA Science Education – Earth Science Emphasis (major code = 827), or
- MA Science Education – Physics Emphasis (major code = 828).

The application fee (for non-UNI alumni) is payable by credit card for on-line applications or is submitted with a written application to:

    Office of the Registrar
    Graduate Admissions, Gilchrist Hall 115
    University of Northern Iowa
    Cedar Falls, IA 50614-0006

Your application must list ALL institutions from which you have completed course work, starting with your bachelor's degree to the present. Have academic institutions send official transcripts for your bachelor's degree and for all course work taken after your bachelor’s degree directly to the Office of the Registrar at the above address.

Decisions on admission to graduate study at UNI will be sent via e-mail. Once admitted, you will be instructed to complete the Application to Graduate Student in Science Education

GRADUATE ASSISTANTSHIPS

If interested in a graduate teaching assistantship stipend and tuition scholarship, obtain the application forms from the Science Education Graduate Coordinator or from the Graduate College web page.
ADMISSION TO GRADUATE STUDY IN SCIENCE EDUCATION

The application to Graduate Study in Science Education can be found on the Science Education Website. Submit the application to the Science Education Graduate Coordinator:

Science Education Graduate Coordinator
McCollum Science Hall 153, UNI
Cedar Falls, IA 50614-0296.
sciedgradcoord@uni.edu

Graduate Teaching Assistantships in Science Education are available. Applications should be completed by February 1, with letters of recommendation received by Feb. 28. Award decisions are made in early March.

Please note that only eight (8) credits of course work (from either UNI OR transfer credits) earned prior to admittance to the Graduate program can be applied to your program. Consequently, it is in your best interest to complete the application process soon after beginning your graduate coursework.

Teaching licensure and endorsement is a requirement of this program. If licensure is not held upon entering the program, it must be completed by the end of the program. International students returning to their home country upon completion of the degree should work with their advisor with respect to licensure and endorsement requirements.

ENGLISH AS A SECOND LANGUAGE

International students and all students for whom English is not their first language, are required to submit TESOL or IELTS exam scores. Minimum scores required by the graduate college are:

- paper-based TOEFL score = 550
- computer-based TOEFL score = 213
- IELTS = 6.5

However, a minimum score does not ensure admission into the Science Education program and is decided by the admissions committee on a case-by-case basis.
ACCEPTANCE TO SCIENCE EDUCATION AND INITIAL FACULTY ADVISOR

Please note that acceptance to graduate study at UNI does not ensure admission to the Science Education Program. You will be notified by Science Education via email and letter indicating your acceptance status into graduate study in Science Education. Once accepted, you will be assigned a faculty advisor by the Science Education Graduate Coordinator based on the information included on the Science Education application form, or you may indicate a preference of faculty advisor to the Science Education Graduate Coordinator. A list of Science Education Faculty can be found on the Science Education web page.

UNIVERSITY STUDENT SERVICE (MY UNIVERSE)

Upon being admitted to UNI you will be assigned a student number and CatID username. If you previously attended/graduated from UNI you will reassume your previous student number and CatID, however you will need to re-set your password/passphrase. The CatID is used for a variety of campus systems including secure Wi-fi access, Email, Blackboard/eLearning and MyUNIverse.

You will be assigned an “@uni.edu” address. Since this is the address used for all University and programmatic announcements, it is highly recommended that you either check this email daily or have email automatically forwarded to another account. See the ITS website for more detailed email instructions.

Blackboard/eLearning is a course management system which you will likely use in several courses. It provides a forum for class based discussion boards, electronic access to materials, assignments, assessments, calendars, announcements, and a variety of other course tools. Check with you individual course instructors for more information.

The MyUNIverse portal allows lifetime access with a current password. See the new student information page for instructions on how to set you username and password. Call 319-273-5555 to reset an expired password. MyUNIverse can be accessed from the UNI home page. This portal provides access to countless resources and processes required for successful completion of your program including:

- UNI email access,
- Checking your University bill (U-bill),
- Registration for classes,
- Accessing your Advisement Report,
- Accessing student request forms for changes in your program plan,
• Accessing transfer credit evaluation forms,
• Accessing the application to graduate form,
• Financial Aid,
• Rod Library, etc.

PROGRAM COMPLETION

GRADUATE PROGRAM COURSE REQUIREMENTS

The Master of Arts in Science Education has one major: MA Science Education. For more specific needs, it can be completed as one of 2 emphases – Physics Education or Earth Science Education. All three options are available as either a Thesis or Non-thesis based program and all require the Science Education Core courses (Table 1)

Table 1: Science Education Core (required by all programs and emphases)

<table>
<thead>
<tr>
<th>Number</th>
<th>Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>SCI ED 6600</td>
<td>Developing Science Curricula</td>
<td>2</td>
</tr>
<tr>
<td>SCI ED 6700</td>
<td>History, Philosophy and the Nature of Science</td>
<td>2</td>
</tr>
<tr>
<td>SCI ED 6800</td>
<td>Teaching-Learning Models in Science Education</td>
<td>2</td>
</tr>
<tr>
<td>SCI ED 6900</td>
<td>Trends and Issues in Science Education</td>
<td>2</td>
</tr>
<tr>
<td>SCI ED 6500</td>
<td>Research Methods in Science Education</td>
<td>3</td>
</tr>
<tr>
<td>(or MEASRES 6205)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td></td>
<td>11</td>
</tr>
</tbody>
</table>

In addition to the Science Education Core, course requirements differ slightly between Thesis and Non-Thesis options (Table 2).

Table 2: Course requirements for Thesis vs. Non-thesis options

<table>
<thead>
<tr>
<th></th>
<th>Thesis Option</th>
<th>Non-Thesis Option</th>
</tr>
</thead>
<tbody>
<tr>
<td>Science Education core (Table 1)</td>
<td>11</td>
<td>11</td>
</tr>
<tr>
<td>Science content electives</td>
<td>8</td>
<td>11</td>
</tr>
<tr>
<td>Education, Science, or Science Education electives</td>
<td>5</td>
<td>7</td>
</tr>
<tr>
<td>Research (SCI ED 6299)</td>
<td>6</td>
<td>3</td>
</tr>
<tr>
<td>Total</td>
<td>30</td>
<td>32</td>
</tr>
</tbody>
</table>

Emphases in Earth Science or Physics require a total of 36 combined semester hours of undergraduate and graduate course work in Earth Science or Physics respectively. At least 8 hrs of those must be at the graduate level (and can count towards the Science content electives).
Immediately after being assigned an advisor, it is your responsibility to arrange a meeting (by phone, e-mail, skype if available, or in person) to discuss your program intentions, plans, and course schedule. This is the only way to ensure timely progression through the program. Please note that only eight (8) credits (from either UNI OR transfer credits) of course work earned prior to admittance to the Graduate program can be applied to your program.

Additionally, teaching licensure and endorsement is a requirement of this program. If licensure is not held upon entering the program, it must be completed by the end of the program. International students returning to their home country upon completion of the degree should work with their advisor with respect to licensure and endorsement requirements.

### COURSE OFFERINGS AND COHORTS

#### REQUIRED CORE COURSE ROTATION

The five Science Education core courses are offered on a rotating basis throughout the academic year and the summer session (Appendix A). Course offerings vary in format and are typically “blended” between synchronous and asynchronous instruction. It is expected that all core courses will require some time on-campus in addition to the on-line component. Since most students are full time teachers, this on-campus component will be conducted on the weekends or in the summers. Currently, no core course is offered totally asynchronous and on-line although electives might be. Consult with your advisor for the current rotation schedule.

#### SCIENCE EDUCATION DISTANCE EDUCATION-COHORT

Periodically Science Education starts a cohort program in which students attend core classes via real time distance education technology such as Adobe Connect. Contact the Science Education Graduate Coordinator for more information.

During a Distance Education-Cohort program all five (5) core courses are offered via distance education. These courses are listed each semester in the Continuing Education course brochure. Distance Education registration should be done through Continuing Education and Special Programs online.

Local students not affiliated with a cohort will register for classes on-line through the UNI Office of the Registrar.
COURSE LOAD

A *minimum* load to be considered a full time graduate student is nine (9) hours, all of which must be 5000 or 6000 level courses. Graduate Assistants must be full time students. The *maximum* load for graduate students who are not on a Graduate Assistantship is fifteen (15) hours, nine (9) of which must be 5000 or 6000 level courses. Maximum load for Graduate Assistants is twelve (12) hours, nine (9) of which must be 5000 or 6000 level courses.

Full-time teachers enrolled in the program part-time are strongly encouraged **not** to exceed three (3) hours of graduate course work per semester. However, many teachers opt to take more during the summer months.

RESEARCH CREDIT (SCI ED 6299)

Both the [Thesis](#) and [Non-thesis](#) programs require the successful completion of a final culminating project, during which, research hours ([SCI ED 6299](#)) are earned. It is strongly recommended that [SCI ED 6500 Research Methods in Science Education](#) (or comparable course) be completed *before* initiating the research project and enrolling in research hours. Research hours may be spread over more than one semester and for varying number of hours per semester, depending on individual project plans. Although research hours may be earned at any time, they are frequently taken during the last 2-4 semesters of the graduate program. No more than the listed number of research hours is counted toward completion of the program.

For projects not completed within the designated term of research registration, a designation of “Research Continuing” (RC) will be assigned as a grade until the project is completed. RC designations must then be changed to a letter grade before graduation. All research hours will receive a Research Continued (RC) designation until the completion of the thesis or culminating project.

Additionally, if all course work has been completed except the final project, students may request “Continuing Registration” for a fee of $50 in lieu of regular tuition fees. This type of registration allows access to MyUNIverse and university library resources. Continuing Registration can be requested through your advisor or the [Science Education Graduate Coordinator](#).
ADVISEMENT REPORT AND STUDENT REQUESTS

ADVISEMENT REPORT

Upon admission to the MA in Science Education Program an official Advisement Report is automatically created in MyUNIverse. It is strongly encouraged that you log into MyUNIverse check your Advisement Report at least twice a year. Access to your Advisement Report and grade reports is available up to 180 days after your last program update/course enrollment, after which, you will no longer have access. Contact your Graduate Advisor if you cannot view your Advisement Report.

The Advisement Report (Appendix B) lists all five required core courses, research hours, and initially designates non-thesis program. Students who chose to pursue the thesis option can change this on their program through a student request. Elective courses which carry a BIOL, CHEM, EARTHSCI, ENV SCI, or PHYSICS prefix, will automatically be applied to "Elective Courses from the College of Natural Sciences (LN-020)." Elective courses which carry a SCI ED pre-fix will automatically be applied to "Education or Science Education Electives (LN-030)." Movement of these courses between these classifications in order to satisfy graduation requirements can be done via student request in consultation with your advisor. Student requests can be filed multiple times over the course of program completion as specific courses are taken.

Transfer courses are not applied to the advisement report until a student request is filed.

STUDENT REQUESTS

Student Request forms (Appendix C) are available in MyUNIverse and are completed and submitted online. Below is a list of the most common student requests and their appropriate form letters:

- G: Exception to Policy: Extension of 7-year time limit to complete degree/Waiver of recency
- M: Declaring electives for the degree (to move electives from one category to another)
- N: Change to Thesis or Non-Thesis option for MA or MS degree
- P: Graduate transfer course credit approval (to transfer in and apply courses from another institution)
- Q: Request registration in an undergraduate course (for graduate students pursuing post-baccalaureate licensure)

Approvals by your advisor, the Science Education Graduate Coordinator and the Graduate College are done electronically. It is strongly recommended you discuss the details of your student request with your advisor before submission.
CREDIT LIMITATIONS (WORKSHOP, TRANSFER, AND EXPIRATION)

A maximum of six (6) hours of workshop credit and seven (7) hours of SCI ED 5500 (Techniques for Science Teachers) can be used on the program. Transfer credits from other institutions can account for up to ten (10) hours of the degree program. Only graduate level courses are accepted on graduate degree programs at UNI and only eight (8) credits (from either UNI OR transfer credits) of course work earned prior to admittance to the Graduate program can be applied to your program.

For transfer credits, it is the student’s responsibility to check the applicability of transfer courses using the “Graduate Transfer Credit Evaluation” form available on MyUniverse or through the Forms Repository. It is best to check a course from another institution before you enroll in it. Generally, courses taken through Iowa Area Education Agencies through Drake or other universities will not apply to graduate programs at Iowa Regents Universities, including UNI. Graduate-level courses taken at Iowa State University and the University of Iowa are accepted automatically at UNI once the transcript has been sent (no transfer evaluation is required). However, check with your advisor regarding whether accepted graduate transfer credits will count toward science content or open electives (if at all) on your Advisement Report.

All course credits are viable for 7 years from the time of enrollment in the first course counted on a program. After 7 years those specific courses cannot be used as part of your program unless extenuating circumstances warrant the filing of a Student Request to extend recency. For example, if a course was taken in the Spring of 2010 but the student does not graduate until Fall of 2017 that course will not count toward program requirements. However, courses completed in Spring of 2017 CAN be applied for a Spring 2017 graduation. Required core courses older than 7 years must be retaken and content or elective courses must have more recent course work substituted.

PROGRAM GRADUATION

GRADUATING

By mid-term of the graduating semester, an “Application for Graduation” must be submitted through MyUNiverse. This adds your name to the list of graduates. Names are easily removed if plans change; however, it is nearly impossible to add a name once the mid-term deadline has passed.

There is a non-refundable graduation fee assessed at the time of the application to graduate. If graduation plans change, an Application to Graduate must be re-filed the
following semester and the fee paid again. Therefore, it is in students’ best interests to work closely with their advisors to be sure they are ready to graduate before filing the application.

Those pursuing the thesis option, must meet all time lines established by the Graduate College for thesis review and submission. Dates are available directly from the Graduate College. Many of these deadlines are several weeks or months prior to commencement so plan accordingly.

Check lists for monitoring progress through your program are included under the specific guidelines for the Thesis (Appendix E) and Non-Thesis (Appendix F) options.

**THESIS VERSUS NON-THESIS OPTION**

In addition to slight differences in course requirements, the main difference between the thesis and non-thesis option is the extent of independent research and creative activity of the final product. Students choosing the thesis option are expected to do an extensive, independent and original data collection research study. Students anticipating further graduate work (such as a Doctoral degree) are advised to choose the thesis option. The Non-thesis option requires a slightly less extensive product but additional course credits.

When deciding which route to follow on your program, the main things to consider are your goals for your master’s program and your own professional goals and interests. Listed below are issues to consider when choosing between the thesis and non-thesis options:

<table>
<thead>
<tr>
<th>Consider the <strong>Thesis Option</strong> if:</th>
<th>Consider the <strong>Non-Thesis Option</strong> if:</th>
</tr>
</thead>
<tbody>
<tr>
<td>• You are interested in conducting some form of research.</td>
<td>• You are interested in a little more course work in content and electives.</td>
</tr>
<tr>
<td>• You have a specific researchable question in mind.</td>
<td>• You would prefer less emphasis on research.</td>
</tr>
<tr>
<td>• You are considering further graduate work (possibly toward a PhD or EdD).</td>
<td>• One of the non-thesis project options fits your situation well.</td>
</tr>
</tbody>
</table>

Regardless of which option is chosen, all final products require a significant amount of writing and will be evaluated by the criteria listed on the Science Education MA Final Project Rubric (Appendix D).
THESIS OPTION

THESIS COMMITTEE

The first step in pursuing the thesis option is to file the student request that switches the Advisement Report to the thesis option. Second, in consultation with your advisor, the members of the thesis committee must be selected. The thesis committee consists of a minimum of three (maximum four) UNI Faculty members, at least two of which must be Science Education Faculty where one of them serves as the Chair of the committee and major research advisor. Additional members must be CHAS or CoE faulty and all members must be on the UNI Graduate Faculty. Your assigned graduate faculty advisor may serve as the Thesis Committee Chair and act as your major research advisor, or if the area of research warrants, a new major advisor can be selected and become the Thesis Committee Chair. Committee members must be selected before the research project is designed and conducted and should be chosen with the assistance of your advisor. A thesis committee approval form must be submitted to the Science Education Graduate Coordinator and Graduate College for approval. The thesis committee assists the student in research design and in the writing of the thesis. The committee eventually accepts or rejects the thesis.

THESIS PROPOSAL

It is strongly recommended that SCI ED 6500 Research Methods in Science Education (or MEASRES 6205) precede initiation of the research project. Before beginning the thesis research project, a formal written proposal of the study to be performed must be presented to the Thesis Committee. The proposal usually consists of what will become the first three chapters of the final thesis. If the study involves human participants, a form must be submitted to and approved by the Institutional Review Board at UNI before data collection begins.

RESEARCH

The thesis option requires six (6) hours of SCI ED 6299 research credit. These six (6) hours may be taken in any combination at any time during the program, but should not be started until some direction in research has been determined by the student and the major advisor. All research hours will receive a Research Continued (RC) designation until the completion of the thesis.
THESIS PREPARATION AND PRESENTATION

Samples of theses are available in the Science Education Resource Center (SERC) in McCollum Science Hall 160. Your advisor may also have samples available for you to review. Specific requirements regarding the preparation and formatting of the thesis can be found in the Graduate College Thesis and Dissertation Manual.

Science Education uses APA style, 6th edition; however, the Graduate College manual supersedes this style in certain instances (such as margins and headings).

A public thesis presentation is required of the thesis project. This must be held before officially submitting the thesis to the graduate college. See the Important Dates for Graduate Students on the Graduate College home page for specific dates. Specific information regarding the preparation and presentation of the thesis is in Appendix E.

After successful submission to the graduate college, three (3) copies, printed on 24 pound white bond paper, 8½ x 11 inch, acid free, 25% or 100% cotton paper must be mailed or delivered to the Science Education secretary, McCollum Science Hall 153. These copies will be professionally bound by Science Education – one for the SERC, one for your major advisor, and one for the graduating student.

NON-THESIS OPTION

FINAL PRODUCT OPTIONS, MAJOR ADVISOR AND OUTSIDE READER

Non-thesis products (called “Creative Components”) can take one of three forms:

1. Curriculum Development Project,
2. Action Research Project or,
3. Portfolio Project based upon National Board of Professional Teaching Standards (NBPTS) certification

See Appendix F for a full description of each option. Samples of all options are available in the Science Education Resource Center, McCollum Science Hall 160. The specific choice of option should be made in consultation with your major advisor.

The major advisor acts as the supervisor of the non-thesis product. Once a non-thesis option is decided on, you and your advisor should select an Outside Reader who will serve as an additional reader of the drafts of your product. This person must be a UNI graduate faculty member and it is recommended that s/he be a Science Education faculty member.
Your major advisor and your Outside Reader must approve the final product.

**NON-THESIS PRODUCT PLANNING AND COMPLETION**

It is advisable to have decided which final product option to pursue by the time approximately one half of the program course work – including the research methods course – are completed.

The Non-thesis option requires three (3) hours of SCI ED 6299 research credit. These three (3) hours may be taken in any combination at any time during the program, but should not be started until some direction for the project has been determined by the student and the major advisor. All research hours will receive a Research Continued (RC) designation until the completion of the creative component.

A written project proposal must be presented to the Major Advisor and Outside Reader before the project is started. Science Education uses the APA 6th edition style manual for all written projects.

The final non-thesis product must be submitted no later than one week prior to the date of graduation for the semester or summer session. Three (3) copies, printed on 24 pound white bond paper, 8½ x 11 inch, acid free, 25% or 100% cotton paper must be mailed or delivered to the Science Education secretary, McCollum Science Hall 153. These copies will be professionally bound by Science Education – one for the SERC, one for your major advisor, and one for the graduating student.
## APPENDICES

### APPENDIX A: TENTATIVE CORE COURSE SEQUENCE THROUGH SUMMER 2019

All courses offered on campus and via distance ed. (with active cohort)

<table>
<thead>
<tr>
<th>Term</th>
<th>Year</th>
<th>Course Code</th>
<th>Course Title</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fall 2012</td>
<td></td>
<td>SCI ED 6900</td>
<td>Trends and Issues in Science Education</td>
</tr>
<tr>
<td>Spring 2013</td>
<td></td>
<td>SCI ED 6800</td>
<td>Teaching-Learning Models in Science Education</td>
</tr>
<tr>
<td>Summer 2013</td>
<td></td>
<td>SCI ED 6700</td>
<td>History, Philosophy, and Nature of Science</td>
</tr>
<tr>
<td>Fall 2013</td>
<td></td>
<td>SCI ED 6900</td>
<td>Trends and Issues in Science Education</td>
</tr>
<tr>
<td>Spring 2014</td>
<td></td>
<td>SCI ED 6500</td>
<td>Research Methods in Science Education</td>
</tr>
<tr>
<td>Summer 2014</td>
<td></td>
<td>SCI ED 6800</td>
<td>Teaching-Learning Models in Science Education</td>
</tr>
<tr>
<td>Fall 2014</td>
<td></td>
<td>SCI ED 6600</td>
<td>Developing Science Curricula</td>
</tr>
<tr>
<td>Spring 2015</td>
<td></td>
<td></td>
<td>No core course offered</td>
</tr>
<tr>
<td>Summer 2015</td>
<td></td>
<td>SCI ED 6700</td>
<td>History, Philosophy, and Nature of Science</td>
</tr>
<tr>
<td>Fall 2015</td>
<td></td>
<td>SCI ED 6900</td>
<td>Trends and Issues in Science Education</td>
</tr>
<tr>
<td>Spring 2016</td>
<td></td>
<td>SCI ED 6500</td>
<td>Research Methods in Science Education</td>
</tr>
<tr>
<td>Summer 2016</td>
<td></td>
<td>SCI ED 6800</td>
<td>Teaching-Learning Models in Science Education</td>
</tr>
<tr>
<td>Fall 2016</td>
<td></td>
<td>SCI ED 6600</td>
<td>Developing Science Curricula</td>
</tr>
<tr>
<td>Spring 2017</td>
<td></td>
<td></td>
<td>No core course offered</td>
</tr>
<tr>
<td>Summer 2017</td>
<td></td>
<td>SCI ED 6700</td>
<td>History, Philosophy, and Nature of Science</td>
</tr>
<tr>
<td>Fall 2017</td>
<td></td>
<td>SCI ED 6900</td>
<td>Trends and Issues in Science Education</td>
</tr>
<tr>
<td>Spring 2018</td>
<td></td>
<td>SCI ED 6500</td>
<td>Research Methods in Science Education</td>
</tr>
<tr>
<td>Summer 2018</td>
<td></td>
<td>SCI ED 6800</td>
<td>Teaching-Learning Models in Science Education</td>
</tr>
<tr>
<td>Fall 2018</td>
<td></td>
<td>SCI ED 6600</td>
<td>Developing Science Curricula</td>
</tr>
<tr>
<td>Spring 2019</td>
<td></td>
<td></td>
<td>No core course offered</td>
</tr>
<tr>
<td>Summer 2019</td>
<td></td>
<td>SCI ED 6700</td>
<td>History, Philosophy, and Nature of Science</td>
</tr>
</tbody>
</table>

Last updated: 12-Jul-19
APPENDIX B: SAMPLE ADVISEMENT REPORT

Academic Advisement Report
Student Name
ID Number 06122012

Requirement Term 2012

△ GRADUATE-LEVEL COURSES (LN-010)
Satisfied: 164 courses may have been taken for undergraduate credit; must be reviewed to verify course was offered for graduate credit (LN-010)
GEO ED 5500 Technol. Inquiry Biol Bio 1.00 2012 FALL A EN
GEO ED 5500 Research 0.00 2012 SPRING B EN
GEO ED 5500 Research 0.00 2012 FALL A EN

SCIENCE EDUCATION MA (2008-present), 9094PA
Not Satisfied: SCIENCE EDUCATION MA (2008-present) - This plan is available on the non-thesis with a min 32 units required and on the thesis option with a min 30 units required. A maximum of 3 units of 6259 credit may be applied to the non-thesis option. (RS-50405)
Units: 20.00 used, 12.00 needed

SCIENCE EDUCATION CORE
Satisfied: SCIENCE EDUCATION CORE - 11 Units Required (RS-51063)

△ Educational Research Course
Satisfied: Educational Research Course - 3 Units Required (LN-010)
SCI ED 6259 Research Methods Geol 1.00 2012 SPRING B EN
SCI ED 6259 Research 0.00 2012 SPRING B EN
SCI ED 6259 Research 0.00 2012 SPRING B EN

△ Science & Science Education
Satisfied: Science & Science Education - 8 Units Required (RS-51060)
SCI ED 6259 has been directed to this line.
SCI ED 6259 has been directed to this line.

Not Satisfied: NON-THESIS REQUIREMENTS - NON-THESIS REQUIREMENTS
Units: 9.00 used; 12.00 needed

△ Research
Not Satisfied: Research - 3 Units Required (LN-010)
SCI ED 6259 Research 1.00 2011 SPRING A EN
SCI ED 6259 Research 1.00 2011 SPRING A EN
SCI ED 6259 Research 1.00 2011 SPRING A EN

△ Elective Courses from the College of Natural Sciences
Not Satisfied: Elective Courses from the College of Natural Sciences - 11 Units Required (LN-020)
Units: 5.00 used; 6.00 needed

GEO 212 3.00 Geology Field Lab 0.00 2012 SPRING B EN
SCI 112 3.00 Introduction to Chemistry 3.00 2012 FALL A EN

COURSES NOT USED BY CURRENT MAJOR (RS-50040)
Courses taken as a graduate student, not applied to current major.
UNI COURSES THAT CARRY UNDERGRADUATE CREDIT (100/200/300/400-LEVEL) CANNOT BE APPLIED TO A GRADUATE DEGREE PROGRAM. SUCH COURSES, IF TAKEN AS A GRADUATE STUDENT, WILL COUNT IN THE CUMULATIVE, BUT NOT GRAD. GPA. (RS-50036)

Courses which need to be moved to "Elective Courses from the College of Natural Science" or "Education or Science Education Electives" via Student Request (Appendix C).
18

Old course numbers; not used after Summer 2011

Notes from processed student requests.
University of Northern Iowa – Graduate Student Academic Request

Student Request ID: 27947
Student Request Type: M - Declaring Electives for Advisement Report (Graduate)
Student Request Created By: Name, Student
Student Request Create Date: 05/01/2013
University ID: 000000
Student Name: Name, Student
Classification: Graduate
Address: 555 Cedar St., Cedar Falls, IA 50613
Major: 821MA – Science Education
Email Address: NameS@uni.edu

Electives:

<table>
<thead>
<tr>
<th>Course</th>
<th>Term</th>
<th>Credits</th>
<th>Apply to RQ#</th>
<th>Apply to LN#</th>
</tr>
</thead>
<tbody>
<tr>
<td>CS 5186</td>
<td>Su 2010</td>
<td>1</td>
<td>60578</td>
<td>030</td>
</tr>
</tbody>
</table>

Is this request increasing the total hours required for the degree? No

Description: I would like to move the credit for this class from "courses not used by major" to "education or science education" electives.

Justification: This class is a graduate level elective class and needs to be applied toward my graduate program.

Submitted Date: 05/01/2013
Final Action Date: 05/09/2013

Processing Information: Processed Date: 05/10/2013
Processed By: MacKay, Pamela S
Processing Notes: CS 5186 section 60 summer 2010

<table>
<thead>
<tr>
<th>Approval Level</th>
<th>Approver</th>
<th>Approval Requested Date</th>
<th>Action Date</th>
<th>Action</th>
<th>Comments</th>
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</thead>
<tbody>
<tr>
<td>1.</td>
<td>Advisor: Stone, Jody M</td>
<td>05/01/2013</td>
<td>05/05/2013</td>
<td>Approved</td>
<td></td>
</tr>
<tr>
<td>2.</td>
<td>Graduate Coordinator: Del Carlo, Dawn I.</td>
<td>05/05/2013</td>
<td>05/09/2013</td>
<td>Approved</td>
<td></td>
</tr>
<tr>
<td>3.</td>
<td>Associate Dean of the Graduate College: Coon, Shoshanna</td>
<td>08/13/2011</td>
<td>08/14/2011</td>
<td>System forwarded to Registrar's Office</td>
<td></td>
</tr>
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</table>
### APPENDIX D: SCIENCE EDUCATION MA FINAL PROJECT RUBRIC

**Master of Arts in Science Education**
**Cumulative Scholarly Work Rubric**

<table>
<thead>
<tr>
<th>Student Name</th>
<th>Student number:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Scholarly Work: Select one</td>
<td>Advisor: Select one</td>
</tr>
<tr>
<td>Evaluator: Select one</td>
<td></td>
</tr>
</tbody>
</table>

#### Scoring Rubric

<table>
<thead>
<tr>
<th>Aspects</th>
<th>Score = 1</th>
<th>Score = 2</th>
<th>Score = 3</th>
<th>Score = 4</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Focus</strong></td>
<td>- Focus of the work is broad, ambiguous, confusing, and the details are minimal.</td>
<td>- Focus of the work is specific, and includes convincing details or insights.</td>
<td>- Focus of the work is thoughtful and targeted, including relevant details, providing a strong, informed base for the work.</td>
<td>- Focus of the work is insightful and rich. Substantive details are interwoven to provide an effective and coherent base for the work.</td>
</tr>
<tr>
<td><strong>Connection to existing Literature or standards</strong></td>
<td>- Literature review provides a minimal examination of the prior research, or the literature review is inadequate.</td>
<td>- Literature review provides a strong theoretical framework outlining prior research related to the focus of the scholarly work.</td>
<td>- Literature review provides in-depth, well-defined examination of the variety and significance of prior research and demonstrates how this research informs the focus of the scholarly work.</td>
<td></td>
</tr>
<tr>
<td><strong>Impact of Master’s Program on Scholarly Work</strong></td>
<td>- Impact of the Master’s Program is unclear.</td>
<td>- Impact of the Master’s Program can be intuitively understood in the scholarly work but is not defined.</td>
<td>- Impact of the Master’s Program is clearly defined although not as well described as a four.</td>
<td>- Impact of the Master’s Program on the scholarly work is demonstrated through the multiple aspects of the work and is significant.</td>
</tr>
<tr>
<td><strong>Quality of Work</strong></td>
<td>- There is little evidence of analysis or synthesis in the scholarly work. The final product is simplistic.</td>
<td>- There is evidence of accurate analytical ability and synthesis in certain sections of the scholarly work, but overall, the conclusions drawn, the curriculum developed, or the questions answered are routine.</td>
<td>- Throughout the work, the conclusions drawn, the curriculum developed, or the questions answered demonstrate logical analysis and thoughtful synthesis.</td>
<td>- Throughout the work, there are multiple examples of reflective analysis, and insightful synthesis. The conclusions, curriculum developed, and/or questions answered provide creative solutions to a challenging focus.</td>
</tr>
<tr>
<td><strong>Implications on Classroom Practice</strong></td>
<td>- There is little evidence of any implications of the scholarly work on classroom practice.</td>
<td>- Implications of the scholarly work on classroom practice are general, and the conclusions or questions are not related to future use.</td>
<td>- Implications of the scholarly work on classroom practice are convincingly defined and are related to future use.</td>
<td>- Implications of the scholarly work on classroom practice are effective and rich in detail and tightly connected to future use.</td>
</tr>
<tr>
<td><strong>Professional Significance of Work</strong></td>
<td>- There is little evidence of the scholarly work on a wider professional community.</td>
<td>- Significance of the scholarly work to the wider professional community is general or is not defined or explained.</td>
<td>- Scholarly work carries significance to the wider professional community and this is fully delineated.</td>
<td>- Scholarly work will inform the wider community and engage them in challenging ways producing significant impact of this community.</td>
</tr>
<tr>
<td><strong>Communication Competency</strong></td>
<td>- Sentence structure varies little, organization is confusing or grammatical errors distract from the scholarly work.</td>
<td>- Sentences are varied in length and structure but may not show much variety as a level 3. Communication may have less organization or may have problems with grammar.</td>
<td>- Sentences are varied in length and structure. They are creative and well connected. Communication flows and contains few if any grammatical errors.</td>
<td>- Language is precise, powerful and engaging. Sentences are varied in length and structure demonstrating creativity, clarity and organization.</td>
</tr>
<tr>
<td><strong>Product Format/ APA Style</strong></td>
<td>- Product format does not conform at all to APA or accepted formatting guidelines.</td>
<td>- Product illustrates rare or occasional, but not consistent use of APA or accepted formatting guidelines.</td>
<td>- Product mostly illustrates use of APA or accepted formatting guidelines, but is still somewhat inconsistent.</td>
<td>- Product format completely follows all APA and accepted formatting guidelines.</td>
</tr>
</tbody>
</table>

This Rubric is meant to be formative as well as summative. A min score of “3” in each aspect is required for successful completion, and consequently is unlikely on thesis proposals or first drafts of products.
APPENDIX E: THESIS OPTION INFORMATION

SELECTING THE THESIS OPTION

"The thesis is a scholarly contribution to knowledge...The thesis may take the form of a study, an experiment, a survey... and may delve deeply into some aspect of a specialized academic field or may concern itself with methodology and materials of instruction. The preparation of a thesis should develop in the student a broader understanding of the world's knowledge and a more genuine appreciation of the research efforts of others" (UNI Graduate College Thesis Manual, p. 1-2).

The following guidelines augment the Graduate College Thesis and Dissertation Manual, addressing specific content and methodology requirements of the Science Education thesis. Students should refer to the Graduate College Website for the full UNI Graduate College Thesis Manual for stylistic requirements and deadlines (listed under “Important Dates for Graduate Students”).

The thesis should result from a rigorous experimental, quasi-experimental, or qualitative research study that adheres to the protocols used in professional science education research. Successful completion of SCI ED 6500 Research Methods in Science Education (or MEASRES 6205) will provide a solid foundation in designing a sound research project. It should focus on a problem or question which, upon completion, adds to the knowledge base in science education. The generation of a thesis topic therefore requires familiarity with the work of others as published in the science education research literature.

KEY REQUIREMENTS OF THE THESIS

THESIS COMMITTEE

The thesis committee consists of a minimum of three (maximum four) UNI Faculty members, at least two of which must be Science Education Faculty where one of them serves as the Chair of the committee and major research advisor. Additional members must be CHAS or CoE faulty and all members must be on the UNI Graduate Faculty. Your assigned graduate faculty advisor may serve as the Thesis Committee Chair and act as your major research advisor, or if the area of research warrants, a new major advisor can be selected and become the Thesis Committee Chair. Committee members must be
selected before the research project is designed and conducted and should be chosen with the assistance of your advisor. A Thesis Committee Approval form must be submitted to the Science Education Graduate Coordinator and Graduate College for approval. The thesis committee assists the student in research design and in the writing of the thesis. The committee eventually accepts or rejects the thesis.

THESIS PROPOSAL

A draft of the Introduction, Cursory Literature Review and proposed Methodology (Chapters 1-3, described below) should constitute the Thesis Proposal. This Thesis Proposal is formally presented to the committee and MUST BE ACCEPTED BEFORE research starts.

HUMAN PARTICIPANTS

Student research involving human participants must be conducted in compliance with the University policy for protection of human subjects. Students planning such projects must consult their thesis advisor about University human participant regulations before beginning any research activities that involve human participants. Further information about regulations and completing a Human Subjects Review Form are available on the IRB Website.

REQUIRED STYLE AND TIME LINE


The time line for completion of thesis preview and thesis submission is not intuitive and may appear to be over zealous. For example, deadlines for a May graduation occur in March of that semester. Consequently, a greater than average level of planning and forethought is required to meet these deadlines and the writing process often takes much longer than expected. See the Important Dates for Graduate Students for exact dates.

THESIS COMPONENTS

Length and specific components of the science education master's thesis vary depending on the nature of the study. The following are suggestions intended to guide the student:

The Title: The best title for a thesis is one that indicates its content as precisely and briefly as possible.
The Abstract: The first element of a thesis document is the abstract, however it should be written last. The abstract should present an account of the thesis that will enable an interested person to determine the desirability of reading the entire work. It needs to be dense with information but also readable, well organized, brief, and self-contained. The maximum length of the abstract is 200 words.

Chapter 1 Introduction: This is an overview of the entire study and should address the following:

1. The framework/context for the research topic; and the problem or question being addressed (including hypotheses if statistical analysis is being used).

2. A brief synopsis of existing research/literature that addresses similar problems or questions and their shortcomings (a more thorough review should be saved for Chapter 2).

3. How the resolution of that problem or question will inform the practices or knowledge of other science education professionals.

4. An overview that clarifies the basis for conducting the study, the methods for executing the study, and the means by which results of the study may be analyzed and interpreted.

Chapter 2 Literature Review: This section explores the research literature that addresses the problem or question of the thesis. All dimensions of the question should be situated within the context of a theoretical framework around which other researchers have explored the question or some facet of the question. It should culminate in a summary that situates this study atop prior works—how it is intended to advance what we know about the problem or question, i.e., how it “fills a gap” in our knowledge base. Use primary literature, including the Journal of Research in Science Teaching, the Journal of Science Teacher Education, and others as recommended by your advisor and discussed in SCI ED 6500 Research Methods in Science Education.

Chapter 3 Methodology: This section should thoroughly describe the data collection and analysis techniques used in developing an answer to the research question. Defend the chosen techniques by reference to prior studies (from the literature review) or by reference to appropriate research protocols designed for this type of study. Data collection and analysis methods (statistics or qualitative) must be defensible as valid and reliable by external standards and accepted practice in science education research.
**Chapter 4 Results:** This section presents the results of data collection through qualitative, quantitative, or mixed methods. Quantitative data should include tables, graphs, and figures where appropriate. Qualitative data should be logically organized and presented.

**Chapter 5 Conclusion:** This section is where the answer to the research question is directly addressed. Discuss your findings in the context of prior work established in the literature review. How do the outcomes of your study agree with, contradict, or in some other fashion merge with current thinking in science education? What explanations might be proffered for reconciling your study's insights with prevailing notions? Also address shortcomings of your study—potential sources of bias, flaws, or other identifiable shortcomings of the research study to which the reader should be advised. Finally, suggest future research options related to this study.

**References:** Be sure to include all references cited.

The finished thesis study should be of sufficient rigor and design quality for the development of a publishable manuscript in a science education research journal.

**THESIS PRESENTATION**

Upon satisfactory completion of the thesis document, a public presentation must be conducted. The presentation should be ~45 min in length and summarize all elements of your project. The presentation should be done during “regular” UNI sessions and according to the [Important Dates for Graduate Students](#).

This presentation can NOT occur before the thesis document is in its final edited form. The writing and editing process often takes several drafts (and several months) during which, students will work mainly with the thesis committee chair but other committee members are available as additional resources.

Use the [Thesis Check List and Timeline](#) below to help plan your thesis.
**THESIS CHECK LIST AND TIMELINE (IN ORDER)**

- Take SCI ED 6500 Research Methods in Science Education (or MEASRES 6205).
- Meet and consult with your advisor on selection of a possible topic, committee selection and file student request to change Advisement Report to the Thesis option.
- Select thesis committee members and submit Thesis Committee Approval Form.
- With advisement from your Thesis Committee Chair, write the Thesis Proposal. At this point, you may start taking some of the required 6 hrs of SCI ED 6299 Research credit. All 6 hrs are expected to be spread out over the following semesters until graduation.
- Formally present the thesis proposal to your Thesis Committee and obtain approval of the project from the committee before proceeding.
- Obtain IRB approval (if using human participants).
- Conduct your research study.
- With advisement from your Thesis Committee Chair, edit the Thesis Proposal to reflect what actually occurred in your study and write the Results and Conclusions chapters. Consult with other members of your committee as needed.
- Inform the Science Education Graduate Coordinator of plans to graduate by:
  - Jan for May graduation
  - March 1 for Summer graduation
  - Sept 1 for December graduation
- File Application to Graduate and check your Advisement Report in MyUNIverse. File any necessary student requests to finalize your Advisement Report.
- Schedule the Thesis Preview (contact Janet.witt@uni.edu) according to the dates outlined in the Important Dates for Graduate Students.
- Arrange a time when the entire thesis committee can be present (NOTE: this is often difficult during the summer months) for the public presentation of your thesis. Bring 5 copies of the Thesis Approval Signature page (see the Thesis Manual) printed on 24 pound white bond paper, 8½ x 11 inch, acid free, 25% or 100% cotton for signing.
- Pay the thesis binding fee (for 2 copies) at Cashier’s window, Office of Business Operations. Save the receipt.
- After the thesis has been approved by all committee members, been publically presented AND previewed by the graduate college, print the thesis on 24 pound white bond paper, 8½ x 11 inch, acid free, 25% or 100% cotton. Deposit the thesis, the 5 copies of the signed Thesis Approval Signature page, and the binding fee receipt in the graduate college by the date listed in the Important Dates for Graduate Students.
- The hard copy of the thesis will be formally previewed one last time and you will be contacted if any further changes are required (often, only 1-2 more pages need to be edited and re-printed).
- After final approval from the Graduate College, submit 3 additional copies of the thesis (except the Thesis Approval Signature page) on 24 pound white bond paper, 8½ x 11 inch, acid free, 25% or 100% cotton to the Science Education Office. These copies will be bound and are for you, your thesis chair, and the Science Education Resource Center.
APPENDIX F: NON-THESIS OPTION DETAILS

SELECTING THE NON-THESIS OPTION

Students choosing the non-thesis option demonstrate their knowledge of science education concepts through completing the science education core courses AND completing a Creative Component. Options for the Creative Component include:

1) Curriculum Development Project
2) Action Research Project
3) Portfolio Project based upon the National Board for Professional Teaching Standards

Specific choice of option should be made in consultation with your major advisor. More elaborate descriptions of each option are listed below.

DESCRIPTION OF CURRICULUM DEVELOPMENT PROJECT

The curriculum development project allows graduate students the flexibility to design curriculum that has significance in a formal or informal classroom setting or provides a significant service to the professional community of science educators. Possible ideas for the curricular development project include, but are not limited to:

- Original curriculum development (not a compilation of other work)
- Assessment package for the classroom
- Integration of technology within an existing curriculum

DESCRIPTION OF THE ACTION RESEARCH PROJECT

The action research project option allows graduate students the opportunity to conduct a short research study that has significance to his/her classroom setting or professional community. Action research is often designed with a focus on one's classroom/students to investigate an issue or problem. Possible ideas for the action research project include, but are not limited to:

- Impact of different pedagogies upon student achievement/attitudes
- Impact of the integration of technology upon student achievement/attitudes
- Impact of different curriculum designs upon student achievement/attitudes
- Impact of different content on student’s understanding of the nature of science
DESCRIPTION OF THE NBPTS PORTFOLIO  
(NATIONAL BOARD OF PROFESSIONAL TEACHING STANDARDS)

The NBPTS Portfolio allows graduate students the opportunity to fulfill portions of the portfolio requirements for NBPTS certification in his/her area of teaching expertise. The student need not apply for NBPTS Certification to complete this project.

In order to fulfill this requirement, the graduate student must be in the classroom and select a certificate area in which s/he is teaching. The standards for the certificate area and the portfolio guidelines can be downloaded from the NBPTS web site. The graduate student shall complete portfolio entries #1, #2, and #4. Since these entries cannot be attached to the final written document, the appendices shall include a copy of the final presentation printed with three slides/page. The literature review should include the research on the impact of Nationally Board Certified Teachers on student achievement and motivation. Much of this research can be found on the NBPTS web site.

KEY REQUIREMENTS FOR THE CREATIVE COMPONENT

COMMITTEE AND PROPOSAL

Each graduate student shall propose his/her creative component via a meeting of two members of the Science Education Faculty, including the graduate student’s advisor and an Outside Reader. Additional faculty can be consulted as appropriate. For this proposal the graduate student must prepare:

1) a clear, brief statement of the project
2) a detailed explanation of the creative component project
3) the significance of the creative component to the formal or informal classroom setting and/or the professional community of science educators.

Once approved, the graduate student and the advisor should determine the timeline for completion of this project, so completion of degree can proceed in a timely fashion.

COMPONENTS OF THE WRITTEN DOCUMENT


The written document should include the following sections:
Chapter 1 Introduction and Framework: This section must include a statement of the project, a brief explanation of the creative component product and an explanation of the significance of the creative component to classroom and/or professional community.

Chapter 2 Relevance and Literature Review: The literature review should thoroughly describe the significant findings of the primary science education literature relevant to the chosen topic. Be sure to explain the potential impact (relevance) of the literature findings on the classroom setting and/or the professional community. Additionally, connections/mapping to the Iowa Core, District standards, or National standards should be made here if appropriate to the project.

Chapter 3 Project: This section contains a more complete explanation of the project and time line (e.g. unit plans, assessment plans, technology use, data collection methods, etc.). Actual curriculum or assessment instruments can be provided in this section or can be appended to the document. If electronic media are used, they can be included in an appropriate form (e.g. CD/DVD, flash drive, etc.).

Chapter 4 Reflection on the Project: The final section explains what was learned through the project. Be sure to describe and discuss:

- the subsequent impact of the project on the classroom setting and/or the professional community
- how the project could be repeated, extended or continued and how the project should be revised based on what was learned
- how completion of this project led to your professional growth
- future directions for your professional growth

References: Be sure to include all works cited. If resources for curriculum development, etc. were used include a general bibliography of those resources.

CREATIVE COMPONENT PRESENTATION

The creative component presentation allows the graduate student to present his/her work to the science education faculty and other interested persons. The presentation should focus on four aspects surrounding the creative component:

1) a brief synopsis of the project;
2) the significance of the project to yourself and the wider professional community;
3) what you learned from the project;
4) where do you go from here?
This presentation may be made via on-line video conferencing and should include an electronic slide presentation (10 slides minimum – 25 slides maximum) and time for questions.

NON-THESIS CHECK LIST AND TIMELINE (IN ORDER)

1. Start your science education core, science content and elective courses.
2. Meet and consult with your advisor on selection of the Creative Component: Curriculum Development Project, Action Research Project, or NBPTS Portfolio AND to discuss options for your Outside Reader.
3. Contact your Outside Reader for his/her acceptance and report this to your advisor and the Graduate Coordinator.
4. Present your Proposal to your Advisor and Outside Reader. At this point, you may start taking some of the required 3 hrs of SCI ED 6299 Research credit. All 3 hrs are expected to be spread out over the following semesters until graduation.
5. Conduct work on your final project and submit drafts of the written document to your graduate advisor for revisions. Consult with your Outside Reader as needed. Complete your final product according to Non-Thesis guidelines.
6. Schedule a Creative component Presentation in consultation with your advisor.
7. Complete your science education core classes, your science content credits, and elective credits.
8. File Application to Graduate and check your Advisement Report in MyUNIverse. File any necessary student requests to finalize your Advisement Report.
9. Submit the final written document to your advisor and Outside Reader one month in advance of intended graduation date. Get approval from both your advisor and Outside Reader.
10. Make three (3) copies of your final, approved product on 24 pound white bond paper, 8 ½ x 11 inch, acid free, 25% or 100% cotton to the Science Education Office one week prior to the date of graduation. These copies will be bound and are for you, your advisor, and the Science Education Resource Center.