

## **Education**

### **ED 5100 - College Teaching**

Covers course preparation, educational testing and evaluation, understanding theories and processes of student learning, developing assignments, instructional strategies (discussions, lecturing, collaborative learning, cases/simulations, etc.), using instructional technologies, motivating students, the roles of the teaching assistant, and using institutional resources for student development.

**Credits:** 2.0

**Lec-Rec-Lab:** (0-2-0)

**Semesters Offered:** Fall, Spring

**Restrictions:** Must be enrolled in one of the following Level(s): Graduate

### **ED 5110 - Educational Psychology**

Review of psychological principles as they relate to human learning. Covers factors in school that contribute to the emotional, psychological stability of the developing child: assessing students' capabilities, setting educational objectives for the child, classroom practices, procedures, teachers' behavior and their relationship to different types of students. All three components of the Early Block must be taken concurrently.

**Credits:** 2.0

**Lec-Rec-Lab:** (0-2-0)

**Semesters Offered:** Fall, Spring

**Restrictions:** Must be enrolled in one of the following Level(s): Graduate

### **ED 5210 - Principles of Education**

Contemporary issues in education from historical, philosophical, sociological, and legal perspectives. Emphasizes the structure/function of U.S. education as well as exceptional children, especially the handicapped and culturally different. This course is one component of the Teacher Education Early Block. Requires admission to teacher education program. All three components of the Early Block must be taken concurrently.

**Credits:** 2.0

**Lec-Rec-Lab:** (0-2-0)

**Semesters Offered:** Fall, Spring

**Restrictions:** Must be enrolled in one of the following Level(s): Graduate

**Co-Requisite(s):** ED 5110, ED 5410

### **ED 5310 - Graduate Seminar in Education**

Introduction to contemporary issues in teacher education. Synthesis of clinical experiences with the psychological foundations of learning and foundations of education courses. Requires a term project.

**Credits:** 1.0

**Lec-Rec-Lab:** (0-1-0)

**Semesters Offered:** Fall, Spring

**Restrictions:** Must be enrolled in one of the following Level(s): Graduate

**ED 5410 - Educational Field Experience**

Observation, tutoring and classroom teaching in an area elementary school classroom. This course is one component of the Teacher Education Early Block. Requires admission to teacher education program. All three components of the Early Block need to be taken concurrently.

**Credits:** 1.0

**Lec-Rec-Lab:** (0-0-3)

**Semesters Offered:** Fall, Spring

**Restrictions:** Must be enrolled in one of the following Level(s): Graduate

**Co-Requisite(s):** ED 5110, ED 5210

**ED 5420 - Mentoring Student Teachers**

Classroom mentoring, support and supervision of student teachers. Emphasis on helping student teachers improve skills in assessment, planning, classroom management.

**Credits:** 1.0; Repeatable to a Max of 6

**Lec-Rec-Lab:** (0-1-0)

**Semesters Offered:** Fall, Spring

**Restrictions:** Permission of department required

**ED 5500 - Special Studies in Educational Psychology**

Individual or group studies of specially selected issues or problems in educational psychology. Credit may be granted for scholarly work under the supervision of departmental-approved, authorized University faculty members that results in an acceptable scholarly product—research reports, curricula, computer program, or other.

**Credits:** variable to 6.0; Repeatable to a Max of 9

**Semesters Offered:** On Demand

**Restrictions:** Permission of instructor required; May not be enrolled in one of the following Class(es): Freshman, Sophomore, Junior

**ED 5510 - Special Studies in Educational Technology**

Individual or group studies of specially selected issues or problems in educational technology. Credit may be granted for scholarly work under the supervision of departmental-approved, authorized University faculty members that results in an acceptable scholarly product—research reports, curricula, computer program, or other.

**Credits:** variable to 6.0; Repeatable to a Max of 9

**Semesters Offered:** On Demand

**Restrictions:** Permission of instructor required

**ED 5520 - Special Studies in Middle and Secondary Methods**

Individual or group studies of specially selected issues or problems in middle and secondary school methods. Credit may be granted for scholarly work under the supervision of departmental-approved, authorized University faculty members that results in an acceptable scholarly product—research reports, curricula, computer program, or other.

**Credits:** variable to 6.0; Repeatable to a Max of 9

**Semesters Offered:** On Demand

**Restrictions:** Permission of instructor required

**ED 5530 - Special Studies in Elementary and Middle Methods**

Individual or group studies of specially selected issues or problems in elementary and middle schools methods. Credit may be granted for scholarly work under the supervision of departmental-approved, authorized University faculty members that results in an acceptable scholarly product-research reports, curricula, computer program, or other.

**Credits:** variable to 6.0; Repeatable to a Max of 9

**Semesters Offered:** On Demand

**Restrictions:** Permission of instructor required

**ED 5540 - Special Studies in Education I**

Individual or group studies of specially selected issues or problems in education. Credit may be granted for scholarly work under the supervision of departmental-approved, authorized University faculty members that results in an acceptable scholarly product-research reports, curricula, computer program, or other.

**Credits:** variable to 6.0; Repeatable to a Max of 9

**Semesters Offered:** On Demand

**Restrictions:** Permission of instructor required

**ED 5550 - Special Studies in Education II**

Individual or group studies of specially selected issues or problems in education. Credit may be granted for scholarly work, under the supervision of departmental-approved, authorized University faculty members that results in an acceptable scholarly product-research reports, curricula, computer program, or other.

**Credits:** variable to 6.0; Repeatable to a Max of 9

**Semesters Offered:** On Demand

**Restrictions:** Permission of instructor required

**ED 5560 - Ecology of Isle Royale for Educators**

K-12 teachers participate in a field-based camping experience on Isle Royale National Park, exploring basic ecological concepts regarding the interrelatedness of plants, animals, geology, climate, and human influences on Isle Royale. Prepares teachers to help students understand interrelationships, energy distribution in ecosystems and change over time.

**Credits:** 3.0

**Lec-Rec-Lab:** (0-1-6)

**Semesters Offered:** Summer

**Restrictions:** Permission of department required

**Pre-Requisite(s):** ED 5561(C)

**ED 5561 - Ecology of Isle Royale Practicum for Educators**

Teachers will implement a one-two week teaching unit based on their experiences in ED5560 and assess its impact on learning in their classroom.

**Credits:** 1.0

**Lec-Rec-Lab:** (0-1-0)

**Semesters Offered:** On Demand

**Restrictions:** Permission of department required

**Pre-Requisite(s):** ED 5560(C)

**ED 5565 - Developing Algebraic Thinking**

Video case studies will be used as a context for the analysis of pedagogical and mathematical issues associated with the teaching and learning of fundamental algebraic ideas. Intended for teachers at the middle and early secondary school levels.

**Credits:** 3.0

**Lec-Rec-Lab:** (0-3-0)

**Semesters Offered:** On Demand

**Restrictions:** Permission of department required; Must be enrolled in one of the following Level(s):  
Graduate

**ED 5570 - Lesson Study**

Teachers will engage in an intensive method of improving instruction that includes designing a lesson with a group of colleagues, implementing the lesson in one of their classrooms, and collectively examining the lesson's effectiveness in engaging students in meaningful learning.

**Credits:** variable to 3.0; Repeatable to a Max of 3

**Semesters Offered:** On Demand

**Restrictions:** Permission of department required; Must be enrolled in one of the following Level(s):  
Graduate

**ED 5600 - Independent Study in Education**

Through an independent study, gain additional insights to relevant topics in education and research. Students must work directly with select faculty to develop a structured line of study on select educational topics.

**Credits:** variable to 6.0; Repeatable to a Max of 9

**Semesters Offered:** On Demand

**Restrictions:** Permission of instructor required

**ED 5601 - Special Content Studies in Education**

Educators' Science and Mathematics Institute Series Courses. Intensive institutes designed to help elementary, middle and high school educators integrate important concepts in math and science into classroom teaching units. New content areas are designed each year to address the needs of participating teachers.

**Credits:** variable to 9.0; Repeatable to a Max of 9

**Semesters Offered:** Fall, Spring, Summer

**ED 5602 - Special Applications in Education**

Educators' Science and Mathematics Institute Series Practicums. Practical application following special content studies during which elementary, middle and high school teachers implement and evaluate a teaching unit that they designed for their own classroom inspired by the previous content course. A mandatory teachers' forum provides opportunity to share ideas with other participating teachers

**Credits:** variable to 9.0; Repeatable to a Max of 9

**Semesters Offered:** Fall, Spring

**ED 5603 - Special Topics in Education**

Teachers' Earth Science Institute Courses. Utilizes mineral science and mineral processing to enhance the teaching of science in middle and high school. Teachers will be involved in hands-on, discovery-based activities that integrate concepts in math, physics, and chemistry with elements of social sciences.

**Credits:** variable to 9.0; Repeatable to a Max of 9

**Semesters Offered:** Spring, Summer

**ED 5620 - Professional Development for Educators: Teaching Earth Science**

A course for the professional development of professional K-12 educators. Topics address ideas, trends, and applications in the teaching and learning of earth science.

**Credits:** variable to 4.0; Repeatable to a Max of 12

**Semesters Offered:** On Demand

**Restrictions:** May not be enrolled in one of the following Class(es): Freshman, Sophomore, Junior

**ED 5630 - Professional Development for Educators: Teaching Life Sciences**

A course for the professional development of professional K-12 educators. Topics address ideas, trends, and applications in the teaching and learning of life science.

**Credits:** variable to 4.0; Repeatable to a Max of 12

**Semesters Offered:** On Demand

**Restrictions:** May not be enrolled in one of the following Class(es): Freshman, Sophomore, Junior

**ED 5640 - Professional Development for Educators: Teaching Environmental Science**

A course for the professional development of professional K-12 educators. Topics address ideas, trends, and applications in the teaching and learning of environmental science.

**Credits:** variable to 4.0; Repeatable to a Max of 12

**Semesters Offered:** On Demand

**Restrictions:** May not be enrolled in one of the following Class(es): Freshman, Sophomore, Junior

**ED 5641 - Global Change Institute for Teachers**

This course will provide teachers with the skills necessary to engage middle/high school students in real-world study of global climate change and its effects on ecosystems. National Content Standards for mathematics, and life, earth, and physical sciences will be addressed.

**Credits:** variable to 4.0; Repeatable to a Max of 4

**Semesters Offered:** Summer

**ED 5650 - Professional Development for Educators: Teaching Physical Science**

A course for the professional development of professional K-12 educators. Topics address ideas, trends, and applications in the teaching and learning of physical science.

**Credits:** variable to 4.0; Repeatable to a Max of 12

**Semesters Offered:** On Demand

**Restrictions:** May not be enrolled in one of the following Class(es): Freshman, Sophomore, Junior

**ED 5660 - Professional Development for Educators: Teaching Mathematics**

A course for the professional development of professional K-12 educators. Topics address ideas, trends, and applications in the teaching and learning of mathematics.

**Credits:** variable to 4.0; Repeatable to a Max of 12

**Semesters Offered:** On Demand

**Restrictions:** May not be enrolled in one of the following Class(es): Freshman, Sophomore, Junior

**ED 5661 - Professional Development for Educators: Teaching Mathematics through Navigation**

This course will cover the theory and practice of marine navigation. Students will learn navigation techniques and procedures while solving navigation problems using mathematics, charts, basic navigation instruments and electronic instruments.

**Credits:** 2.0

**Lec-Rec-Lab:** (0-1-2)

**Semesters Offered:** Summer

**Restrictions:** Permission of department required; May not be enrolled in one of the following Class(es): Freshman, Sophomore, Junior

**ED 5665 - Professional Development for Educators: Teaching Computer Science**

A course for the professional development of professional K-12 educators. Topics address ideas, trends, and applications in the teaching and learning of computer science.

**Credits:** variable to 4.0; Repeatable to a Max of 12

**Semesters Offered:** On Demand

**ED 5670 - Professional Development for Educators: Teaching Technology**

A course for the professional development of professional K-12 educators. Topics address ideas, trends, and applications in the teaching and learning of technology.

**Credits:** variable to 4.0; Repeatable to a Max of 12

**Semesters Offered:** On Demand

**Restrictions:** May not be enrolled in one of the following Class(es): Freshman, Sophomore, Junior

**ED 5680 - Professional Development for Educators: Teaching Social Studies**

A course for the professional development of professional K-12 educators. Topics address ideas, trends, and applications in the teaching and learning of social studies.

**Credits:** variable to 4.0; Repeatable to a Max of 12

**Semesters Offered:** On Demand

**Restrictions:** May not be enrolled in one of the following Class(es): Freshman, Sophomore, Junior

**ED 5690 - Professional Development for Educators: Teaching Language Arts**

A course for the professional development of professional K-12 educators. Topics address ideas, trends, and applications in the teaching and learning of language arts.

**Credits:** variable to 4.0; Repeatable to a Max of 12

**Semesters Offered:** On Demand

**Restrictions:** May not be enrolled in one of the following Class(es): Freshman, Sophomore, Junior

**ED 5695 - Professional Development for Educators: Teaching Business**

A course for the professional development of professional K-12 educators. Topics address ideas, trends, and applications in the teaching and learning of business.

**Credits:** variable to 4.0; Repeatable to a Max of 12

**Semesters Offered:** On Demand

**Restrictions:** May not be enrolled in one of the following Class(es): Freshman, Sophomore, Junior

**ED 5700 - Science Education Research**

In-depth study of education research methods pertaining to classroom practice, curriculum standards, and program evaluation. Course will include an opportunity to design research to answer questions relevant to classroom teaching and learning. Equivalent to ED 5701 plus ED 5702.

**Credits:** 2.0

**Lec-Rec-Lab:** (0-2-0)

**Semesters Offered:** Fall

**ED 5701D - Science Education Research Methods**

Study of research methods in science education. Issues of research design, program evaluation, and data presentation will be addressed.

**Credits:** 1.0

**Lec-Rec-Lab:** (0-1-0)

**Semesters Offered:** Fall

**Restrictions:** Must be enrolled in one of the following Class(es): Graduate

**ED 5702D - Action Learning and Action Research**

A form of systematic inquiry conducted by teacher researchers to gain insight into how students learn. Use of scientific research projects to teach science in secondary schools. Developing students as communities of science learners.

**Credits:** 1.0

**Lec-Rec-Lab:** (0-1-0)

**Semesters Offered:** Fall

**Restrictions:** Must be enrolled in one of the following Class(es): Graduate

**ED 5730 - Science Learning Materials, Inquiry and Assessment**

Examination of learning materials that enable inquiry-based learning as prescribed by National Science Education Standards. Assessment techniques to measure this type of learning will be considered.

Equivalent to ED 5731 plus ED 5732.

**Credits:** 2.0

**Lec-Rec-Lab:** (0-2-0)

**Semesters Offered:** Spring

**ED 5731D - Science Learning Materials and Inquiry**

Inquiry, as described by the National Science Education standards, will serve as the focus of a survey of learning materials, particularly those that are internet-based. Identification, selection, and evaluation of source materials for teaching science.

**Credits:** 1.0

**Lec-Rec-Lab:** (0-1-0)

**Semesters Offered:** Spring

**Restrictions:** Must be enrolled in one of the following Class(es): Graduate

**ED 5732D - Assessing Science Learning**

A survey of alternative and authentic assessment techniques for ensuring consistency, reliability, and fairness in evaluating science learning. Assessment planning techniques reviewed will use both national and state standards as guides to measure outcomes.

**Credits:** 1.0

**Lec-Rec-Lab:** (0-1-0)

**Semesters Offered:** Spring

**Restrictions:** Must be enrolled in one of the following Class(es): Graduate

**ED 5740 - Connecting Michigan Science Benchmarks and Research**

Current research and classroom practice will be examined using the Michigan Mathematics and Science Benchmarks. Objective is to further understanding of how goals can promote higher levels of learning.

Equivalent to ED 5741 plus ED 5742

**Credits:** 2.0

**Lec-Rec-Lab:** (0-2-0)

**Semesters Offered:** Fall

**Pre-Requisite(s):** ED 5700

**ED 5741D - Michigan Benchmarks**

An examination of the Michigan Mathematics and Science Benchmarks from the standpoint of national goals, standardized assessment, and classroom practice.

**Credits:** 1.0

**Lec-Rec-Lab:** (0-1-0)

**Semesters Offered:** Fall

**Restrictions:** Must be enrolled in one of the following Class(es): Graduate

**Pre-Requisite(s):** ED 5700

**ED 5742D - Research Trends and Classroom Practice**

An exploration of the major issues and applicable research results that apply to the teaching and learning of secondary science and mathematics.

**Credits:** 1.0

**Lec-Rec-Lab:** (0-1-0)

**Semesters Offered:** Fall

**Restrictions:** Must be enrolled in one of the following Class(es): Graduate

**Pre-Requisite(s):** ED 5700

**ED 5750 - Diagnosis and Remediation of Reading Problems**

Identification of problems related to reading and language processing; identification and application of diagnostic, remediation and assessment strategies and instruments. Classroom specific experience in diagnosis and remediation of the total communication process.

**Credits:** 3.0

**Lec-Rec-Lab:** (0-2-2)

**Semesters Offered:** On Demand

**Restrictions:** Permission of department required; Must be enrolled in one of the following Level(s):  
Graduate

**ED 5810 - Advance Methods of Teaching Science, Math, and Computer Science**

Application of learning and instructional theories to the teaching of science, mathematics, and computer science. Emphasizes methods of materials used to teach early adolescents. Taught from the perspective of science/math/computer science teachers. Lab offers opportunities to refine instructional techniques. Admission to teacher education required.

**Credits:** 4.0

**Lec-Rec-Lab:** (0-3-3)

**Semesters Offered:** On Demand

**Restrictions:** Permission of department required; Must be enrolled in one of the following Level(s):  
Graduate

**Co-Requisite(s):** ED 5910

**Pre-Requisite(s):** ED 5110 and ED 5210 and ED 5310 and ED 5410

**ED 5900 - Graduate Research in Education**

Students will conduct a research project/report as a capstone to an approved plan of study. The student should present a project plan to their education advisor for approval, conduct whatever work is necessary for the project, prepare a final report at the conclusion of the project, and defend the project/report in an oral presentation.

**Credits:** variable to 6.0; Repeatable to a Max of 6

**Semesters Offered:** Fall, Spring, Summer

**Restrictions:** Must be enrolled in one of the following Level(s): Graduate

**Pre-Requisite(s):** ED 5700

**ED 5910 - Teaching Internship**

Knowledge of human growth and learning theories, methods and materials, and individual differences applied to classroom settings, conducted under the supervision of an experienced middle or secondary school teacher. Completion of MTTC Basic Skills Test. See department for application deadlines.

**Credits:** 12.0

**Lec-Rec-Lab:** (0-0-36)

**Semesters Offered:** Fall, Spring

**Restrictions:** Must be enrolled in one of the following Level(s): Graduate

**Co-Requisite(s):** ED 5810

**Pre-Requisite(s):** ED 5110 and ED 5210 and ED 5410

**ED 5920 - Teaching Internship - Preparation for International Teaching**

Application of learning theory, including individual differences and content specific pedagogy, in a classroom setting, conducted under supervision of an experienced secondary teacher. Preparation for placement in teaching position with the Peace Corps. Requires completion of MTTC Basic Skills Test.

**Credits:** variable to 6.0

**Semesters Offered:** On Demand

**Restrictions:** Permission of department required; Must be enrolled in one of the following Level(s):  
Graduate

**Pre-Requisite(s):** ED 4710(C) or ED 5810(C)

**ED 5921 - International Teaching Internship**

Application of learning theory, including individual differences and content specific pedagogy, in an international classroom through Peace Corps service. Internship is conducted under the supervision of an experienced secondary teacher. Requires completion of MTTC Basic Skills Test.

**Credits:** variable to 12.0

**Semesters Offered:** On Demand

**Restrictions:** Permission of department required; Must be enrolled in one of the following Level(s):  
Graduate

**Pre-Requisite(s):** ED 4710 or ED 5810

**ED 5994 - Field Work in International Science Education**

Field work and reporting from students in the Peace Corps Master's International Program in Science Education.

**Credits:** 1.0; Repeatable to a Max of 10

**Lec-Rec-Lab:** (0-1-0)

**Semesters Offered:** Fall, Spring, Summer

**Restrictions:** Permission of instructor required; Must be enrolled in one of the following Level(s):  
Graduate

**Graduate Course Descriptions Effective Fall 2007**

[https://www.banweb.mtu.edu/pls/owa/stu\\_ctg\\_utils.p\\_online\\_all\\_courses\\_gr](https://www.banweb.mtu.edu/pls/owa/stu_ctg_utils.p_online_all_courses_gr)

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