### DEGREE PROGRAMS

#### Mathematics Education and Middle Grades Education

#### MATH 5215 — Numerical Analysis
3(3-0)
Nature of error, Gaussian elimination for linear systems; iteration, Newton's method, steepest descent for nonlinear systems, zeros of polynomials and interpolation. Prerequisite: MATH 5211 or consent of instructor.

#### MATH 5311 — Geometry for Teachers***
3(3-0)
Points, lines, planes, parallel and perpendicular lines, congruence, similarity, measurement, constructions, space figures, analytical geometry and non-Euclidean Geometry. Prerequisite: Graduate standing.

#### MATH 5312 — Foundations of Geometry
3(3-0)
Euclidean and non-Euclidean geometry, including incidence, order and the parallel postulate. Prerequisite: Graduate standing.

#### MATH 5313 — Modern Geometry
3(3-0)
An algebraic approach to geometry using vectors and transformations. For secondary teachers. Prerequisite: MATH 5112 or consent of the instructor.

#### MATH 5314 — Introduction to Point Set Topology
3(3-0)
Set theory, general topological spaces, product spaces, sequences, compactness, connectedness, metric spaces and Tychonoff theorem. Prerequisite: Graduate standing.

#### MATH 5410 — Probability and Statistics for Teachers***
3(3-0)
Probability, gathering and recording data, construction and use of tables, tabulating and graphing percentiles, mean and standard deviation, frequency distributions, normal distribution and statistical interference correlation. Prerequisite: consent of instructor.

#### MATH 5412 — Methods of Statistical Analysis
3(3-0)
Estimation and inference using basic probability distributions, analysis of variance, analysis of covariance, regression, correlation and basic experimental design. Prerequisite: a previous course in statistics.

#### MATH 5414 — Introduction to Operations Research
3(3-0)
Linear programming, the simplex method, network theory, games theory, Markov analysis; other topics including inventory analysis and queuing theory. Prerequisite: graduate standing.

#### MATH 5511 — History of Mathematics
3(3-0)
Growth and development of the discipline of mathematics from antiquity to modern times. Special emphasis given to the evolutionary character of the principal ideas of modern mathematics.

#### MATH 5670 — Special Topics in Mathematical Sciences
3(3-0)
An exploration of special topics of current interest in the mathematical sciences. Prerequisite: consent of instructor.

*** No credit is given towards the graduate program in Mathematics Education. (See courses on page 87)

### MIDDLE GRADES EDUCATION

The basic objective of the Masters of Education program in Middle Grades Education is to provide teachers with the opportunity to:

1. Compare their teaching practices with current research-based practices and make changes where necessary;
2. Extend their knowledge and skills in a chosen area of educational interest;
3. Present intellectually challenging thoughts and practices to students;
4. Integrate new materials and methods of teaching into students' teaching repertoire;
5. Encourage interest in conducting research;
6. Increase competencies in research techniques; and
7. Increase students' ability to recognize relevant research, which they can use to become more effective in their classrooms.

As students progress through the program, they should increasingly incorporate the following six characteristics/traits into their interpersonal skills: facilitation, humanness, knowledgeable, motivation, multiculturalism, and solution generation. As the program builds the desire to strengthen these traits, it reinforces the following key components of a middle school:
1. A curriculum that is challenging, integrative, and exploratory;
2. Varied teaching and learning approaches;
3. Assessment and evaluation that promotes learning;
4. Flexible classroom organization structures;
5. Instruction which fosters health, wellness, safety; and
6. Comprehensive guidance and support services.

This program leads to the LEVEL 5 certification in Middle Grades Education and is designed to prepare teachers to work with children in grades four through eight.

**PLANNED DEGREE PROGRAM**

**Area A - Nature of the Learner**

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
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</thead>
<tbody>
<tr>
<td>PSYC 5530</td>
<td>Adolescent Psychology</td>
</tr>
<tr>
<td>SPED 5547</td>
<td>Behavioral Management of Exception Children</td>
</tr>
<tr>
<td>PSYC 5515</td>
<td>Educational Psychology</td>
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</tbody>
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**Area B - Programs and Problems of the School**

<table>
<thead>
<tr>
<th>Course</th>
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<tbody>
<tr>
<td>EDUC 5509</td>
<td>Philosophy of American Education</td>
</tr>
<tr>
<td>MGED 5541</td>
<td>Nature &amp; Curriculum Needs of Middle Grade Students</td>
</tr>
</tbody>
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**Area C - Teaching Field (Minimum of 15 hours)**

**Mathematics**

<table>
<thead>
<tr>
<th>Course</th>
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<tbody>
<tr>
<td>MGED 5532</td>
<td>Methods &amp; Materials for Teaching Mathematics in Middle Grades</td>
</tr>
<tr>
<td>MGED 5530</td>
<td>Math Concepts in Middle Childhood Education</td>
</tr>
<tr>
<td>MATH 5202</td>
<td>Technology Oriented Mathematics</td>
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</tbody>
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**Language Arts**

<table>
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<tr>
<th>Course</th>
<th>Title</th>
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<tbody>
<tr>
<td>MGED 5520</td>
<td>Language Arts Concepts for Middle Childhood</td>
</tr>
<tr>
<td>READ 5503</td>
<td>Improving Reading Instruction for Middle School</td>
</tr>
<tr>
<td>ENGL 5515</td>
<td>Advanced Exposition for Teachers</td>
</tr>
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**Science**

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<thead>
<tr>
<th>Course</th>
<th>Title</th>
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<tbody>
<tr>
<td>EDUC 5570</td>
<td>Strategies of Instruction in Science</td>
</tr>
<tr>
<td>PHYS 5500</td>
<td>Earth Science</td>
</tr>
</tbody>
</table>

**Social Science**

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<tr>
<th>Course</th>
<th>Title</th>
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<tbody>
<tr>
<td>SSCI 5580</td>
<td>Social Studies Concepts and Issues</td>
</tr>
<tr>
<td>MGED 5581</td>
<td>Methods &amp; Materials in Teaching Social Studies</td>
</tr>
<tr>
<td>SSCI 5583</td>
<td>Social Studies for Global Understanding</td>
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</table>

**Area D - Research (Minimum of 6 hours)**

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
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</thead>
<tbody>
<tr>
<td>EDUC 5501</td>
<td>Educational Research</td>
</tr>
<tr>
<td>EDUC 5500</td>
<td>Educational Statistics</td>
</tr>
</tbody>
</table>
Middle Grades Education

Area E - Middle Grades Electives (Minimum of 6 hours) 6 hrs

EDUC 5502  Action/Classroom Research
EDUC 5540  Curriculum Principles
PSYC 5515  Educational Psychology
SPED 5501  Exceptional Children
SPED 5547  Behavioral Management of Exceptional Children

Total Required Hours ............................................... 36 hours

Some Acceptable Courses for Substitutions
(Substitutions must be approved by your advisor)

EDAS 5501  Introduction to Organizational Leadership (Area E)
EDUC 5500  Educational Statistics (Area D or E)
EDUC 5540  Curriculum Principles (Area B or E)
SPED 5501  Exceptional Children and Youth (Area E)

COURSE DESCRIPTIONS

ARST 5501 — Art Education for Children .................................................. 3(3-0)
Materials, methods and curricula for an elementary art program. Emphasis is on developing procedures and understanding of media for use in the instruction of children at the elementary level.

MGED 5520 — Language Arts Concepts for Middle Childhood .................................. 3(3-0)
Focuses on the language arts instructional program for early adolescent students.

MGED 5530 — Mathematics Concepts for Middle Childhood Education .................. 3(3-0)
Study of the following as they relate to the learning and teaching of middle grade mathematics: strategies and materials, the child’s mathematical development and understanding and assessment.

MGED 5532 — Methods and Materials of Teaching Middle Grades Mathematics .......... 3(3-0)
Instructional materials and evaluation in teaching mathematics in the middle school.

MGED 5534 — Topics in School Mathematics Curriculum .................................. 3(3-0)
In-depth study of one or two topics which are included in the school mathematics curriculum. May be repeated for credit when topics change.

MGED 5535 — Topics in Middle Childhood Mathematics .................................. 3(3-0)
An integrated approach to content and methods for teaching selected topics in mathematics appropriate for the middle childhood curriculum. An in-depth investigation of selected topics including number theory, graphs, measurement, problem solving, applications, calculators and assessment materials and techniques.

MGED 5541 — Nature and Curriculum Needs of the Middle Grades Student .............. 3(3-0)
An integrated in-depth study of the middle grades children with particular reference to their unique characteristics and needs. Selected topics will cover the historical development of the middle school, program goals, principles of curriculum development, organizational design of the middle school, instructional strategies, and multiple authentic assessments.

MGED 5572 — Methods and Materials of Teaching Science .................................. 3(3-0)
Activities are selected from the newer curricula projects to give students an overview of each one at various grade levels. These activities are selected from environmental science; early science curriculum project; science curriculum improvement study; science: a process approach; elementary science and others.
MGED 5581 — Methods and Materials in Teaching Social Studies .......................... 3(3-0)
This course covers instructional procedures, materials and evaluation in teaching social sciences.

SSCI 5580 — Social Studies Concepts and Issues ........................................... 3(3-0)
The application of basic social science concepts, skills and processes to the analysis of critical social issues. An interdisciplinary, analytic approach to defining, analyzing and evaluating alternative solutions to local, national and international issues will be undertaken.

SSCI 5582 — Young Child and His or Her Culture ........................................... 3(3-0)
Study of the social, political, geographic, economic and technological forces that shape the child’s world. Emphasis on the concomitant skills of the presentation of relevant information about such forces.

SSCI 5583 — Social Studies for Global Understanding .................................... 3(3-0)
Social sciences concepts related to a global perspective will be explored through methodologies of history and the social sciences. Students will be encouraged to clarify their own values regarding a global perspective of education.

SSCI 5584 — Concepts and Problems in Law-Related Education ................... 3(3-0)
Presentation of information to assist students in teaching the following law-related areas: criminal justice, crime resistance, consumer litigation, family, juvenile, and school law.

MUSIC EDUCATION
The graduate program in Music Education is designed to nurture scholarship, encourage creativity and be receptive to the practical needs of the student. The program provides an opportunity for students to pursue independent projects which may help in the pursuit of increased academic edification or that focus on areas of personal interest.

Students seeking a degree in Music Education are required to take a placement examination in music theory, music history and pass an audition in their respective performance area. In addition, students who enter the program must have an undergraduate degree in Music Education, an L-4 certificate in music, or equivalent course work to qualify for an L-4 certificate.

Objectives
Upon satisfactory completion of the music program, the student should be able to:
1. Demonstrate the ability to do critical thinking and scholarly writing through selecting areas of interest, researching topics and reporting findings in an organized, systematic and logical manner.
2. Identify crucial or relevant issues in music education of current interest at the district, state, and national levels and report the same through class discussions and research papers.
3. Communicate an awareness of concepts as advanced by leading writers and researchers in the field of aesthetics and music education.
4. Perform on applied instrument or voice, and/or demonstrate instrumental or choral conducting ability that is at a level consistent with training and experience expected of a graduate musician.
5. Demonstrate the ability to interpret and articulate methods of acquiring musical facility through applied teaching.
6. Critically appraise reference works in music and music education.
7. Formulate predictions about trends/directions in music education, based upon past and current trends, and experiences.
8. Apply theories of learning in traditional as well as non-traditional arenas of music education.
9. Engage in professional dialogue with confidence and authority.

Comprehensive Examination Policy
In partial fulfillment of the requirements for the M.Ed. degree in Music Education, students are required to satisfactorily pass a comprehensive examination and a teaching demonstration. These may be taken during the final two semesters of the program. A student is eligible to take the comprehensive examination only if the GPA is 3.0 or higher. Failure to pass the third attempt will result in termination from the degree program.