

B.A. IN MATHEMATICS WITH EDUCATION 5-12 LICENSURE

Code	Title	Credits
Major in Mathematics with Education 5-12 Licensure (B.A.)		
MAT 124M	Calculus 1	4
MAT 125	Calculus 2	4
MAT 211	Linear Algebra	3
MAT 223	Multivariable Calculus	3
MAT 241	Discrete Mathematics	3
MAT 310	Algebraic Structures	4
MAT 330	Probability and Statistics	3
MAT 351	Modern Geometry	3
MAT 422	Real Analysis	3
MAT 499	Foundations of Mathematics	3
COS 100	Introduction to Programming	3
COS 105	Computer Science 1	4
Choose one of the following Applied Math courses:		3-4
MAT 331	Applied Statistics	
MAT 344	Numerical Methods	
MAT 376	Operations Research	
EDU 200	Introduction to Education	3
EDU 201	Introduction to Education Field Experience	1
EDU 203	School Health and Drugs	2
EDU 220	Introduction to Middle Level Education	3
EDU 240	Educational Psychology	3
EDU 241	Educational Psychology Field Experience	1
EDU 317GZ	Educational Equity	3
EDU 320	Pedagogy and the Young Adolescent Learner	1
EDU 321	Integrated Literacy in the Content Areas	1

EDU 411	Mathematics Education Practicum in grades 5-8 or 5-12	1
EDU 412	Methods in Teaching 5-12 Mathematics	3
EDU 490	Student Teaching Block ¹	14
Code	Title	Credits
Major *		79-80
General Education		49-50
Total Credits		129

¹ In order to meet requirements for endorsements and dual majors this number is subject to change. Students should consult with their advisor.

* Courses whose number is followed by a letter fulfill a General Education requirement.

Students must earn a grade of C or better in each content area and education course (MAT, COS, EDU) in the major. Courses with grades of C- or lower must be repeated.

Students with 5-12 licensure in Mathematics Education may choose one or more Middle Level Endorsements. See endorsement area listing under Major in Elementary Education with Middle Level Endorsement in the Education section of this catalog

EDU 200 • Introduction to Education 3 Credits. Contemporary issues in education in the light of history and educational thought. Various aspects of growth and development are included. *Prerequisites: EDU 201; 30 Credits. Offered: Fall, Interim, Spring.*

EDU 201 • Introduction to Education Field Experience 1 Credit. A field experience requiring four hours per week observing and serving in an elementary or secondary school classroom. *Corequisites: EDU 200. Offered: Fall, Interim, Spring. Special Notes: Designated times are set by the Education department.*

EDU 203 • School Health and Drugs 2 Credits. Examines the roles of teachers and schools in responding to adolescent health problems, including alcohol/drug problems, with particular attention to health promotion, prevention, and referral. Approaches adolescent drug/alcohol use from a variety of perspectives—behavioral, pharmacological, social, legal, and clinical.

Emphasis is on the characteristics of effective comprehensive school-based drug abuse prevention programs.

Offered: Fall, Spring.

EDU 204UZ • Teaching and Learning in Guadalajara 3 Credits.

Onsite experiential course designed to introduce students to Mexican culture and education in the city of Guadalajara. Components include observing and teaching in a Christian school, a homestay with a Mexican family, creation of a classroom ethnography, and an opportunity to reflect on the culture and education process of one Mexican school.

Prerequisites: GES 130 or GES 244; written consent of instructor. Special Notes: Course may count as a Spanish elective provided all work is completed in Spanish. Offered: Occasionally interim.

EDU 220 • Introduction to Middle Level Education 3 Credits.

Identifies and defines the concept of exemplary and typical middle and junior high schools: philosophy, organizational structure, curriculum, and instructional characteristics. Students develop an understanding of the physical, emotional, social, cognitive, and moral stages of adolescent development and begin to develop the ability to relate middle-level program possibilities to adolescent developmental needs.

Prerequisites: EDU 200; EDU 201; Admission to the education program. Corequisites: May be taken concurrently with EDU 320. Offered: Fall, Spring.

EDU 236UZ • Exploring British Education and Culture 3 Credits.

Designed for students to immerse themselves in British culture and explore the educational system, with an emphasis on the diverse populations of Pakistani and Indian students and schools. Provides students with three learning experiences: 1) observation and participation in British elementary and secondary schools; 2) homestay with a British family; and 3) cultural exploration in London and surrounding areas.

Prerequisites: EDU 200; EDU 201; GES 130 or GES 244; Admission to the education program. Offered: Occasionally interim.

EDU 240 • Educational Psychology 3 Credits.

Psychological foundations of education. Various aspects of growth and development, the nature and conditions of learning, implications for teaching, and evaluation.

Prerequisites: EDU 200; EDU 201; admission to the education program. Offered: Fall, spring. Special

Notes: Intended for 5-12 and K-12 licensure students only.

EDU 241 • Educational Psychology Field Experience 1 Credit.

A field experience that requires four hours per week in an elementary or secondary school for observation and tutorial experience in a special education setting.

Prerequisites: EDU 200; EDU 201; Admission to the education program. Corequisites: Must be taken concurrently with EDU 240. Offered: Fall, Spring. Special Notes: Designated times are set by the Education department.

EDU 250 • Educating the Exceptional Child 3 Credits.

Teacher candidates learn the historical and legal foundations of educating exceptional children. Instructional design, teaching, referral, assessment, team planning, and placement procedures are introduced. The role of the family is discussed. All of the above are accomplished in the context of cultural pluralism.

Offered: Spring.

EDU 271 • Education Psychology and Pedagogy 2 Credits.

Foundational knowledge about the theories of learning, cognitive development, instructional planning and assessment practices, and professional reflection.

Prerequisites: EDU 200; EDU 201; Admission to the education program. Corequisites: Must be taken concurrently with EDU 272; EDU 273; EDU 274; EDU 275. Offered: Fall, Spring.

EDU 272 • Language and Literacy Development for Young Learners (K-3) 5 Credits.

Foundational knowledge about language development, literacy development, instructional methods, assessment practices, the creation of a literate and motivating environment, and the encouragement of family engagement in literacy.

Prerequisites: EDU 200; EDU 201; Admission to the education program. Corequisites: Must be taken concurrently with EDU 271; EDU 273; EDU 274; EDU 275. Offered: Fall, Spring.

EDU 273 • Primary Grade Practicum 1 Credit.

Application of effective practices done in a primary classroom, working with individual students and small reading groups.

Prerequisites: EDU 200; EDU 201; Admission to the education program. Corequisites: Must be taken concurrently with EDU 271; EDU 272; EDU 274; EDU 275. Offered: Fall, Spring.

EDU 274 • Education Technology 1 Credit.

Methods of integrating technology into the primary grades classroom are considered. Focus on approaches with technologies that are research-based, enhance student learning, and are linked to effective instructional strategies. Professional growth/development and developing digital citizenship/responsibility are considered. *Prerequisites: EDU 200; EDU 201; admission to the education program. Corequisites: Must be taken concurrently with EDU 271; EDU 272; EDU 273; EDU 275. Offered: Fall, Spring.*

EDU 275 • Kindergarten Education 1 Credit.

Characteristics of kindergarten children and the curriculum and teaching strategies appropriate for their developmental level. *Prerequisites: EDU 200; EDU 201; Admission to the education program. Corequisites: Must be taken concurrently with EDU 271; EDU 272; EDU 273; EDU 274. Offered: Fall, Spring.*

EDU 292 • Foundations of Early Childhood Education 3 Credits.

History, philosophy, goals, content of early childhood education programs, and updated research in child development. Analysis of teaching strategies appropriate for the development of children ages three to five years. Career opportunities in early childhood education. *Offered: Fall.*

EDU 293 • Foundations of Early Childhood Field Experience 1 Credit.

Supervised observation and participation at Bethel University's child development center or a partnering community early childhood education site. *Corequisites: Must be taken concurrently with EDU 292. Offered: Fall.*

EDU 306 • Curriculum in Early Childhood Education 3 Credits.

Developmental appropriateness of current curriculum models, equipment, and materials in an early childhood education program. *Prerequisites: EDU 200; EDU 201; EDU 292; EDU 293. Offered: Spring*

EDU 307 • Curriculum in Early Childhood Education Field Experience 1 Credit.

Field experience at one of Bethel University's child development centers or approved community partner site utilizing strategies learned in EDU 306. *Prerequisites: EDU 200; EDU 201; EDU 292; EDU 293. Corequisites: Must be taken concurrently with EDU 306. Offered: Spring*

EDU 317GZ • Educational Equity 3 Credits.

Root causes and historical origins of the current disparity of opportunities in U.S. educational systems. Prepares future educators to be culturally competent and responsive critical thinkers who understand the barriers that perpetuate inequities. Addresses these challenges from a biblical and leadership perspective.

Prerequisites: [GES 130; GES 160; Contemporary Western Life and Thought (L) course; World Cultures (U) course] or [GES 244; World Cultures (U) course]. Offered: Fall, Interim, Spring. Special Notes: Includes experiential learning in schools and community events.

EDU 320 • Pedagogy and the Young Adolescent Learner 1 Credit.

The philosophy and pedagogy of teaching in a middle school is different than teaching in a junior high school. Course activities help students define, describe, and develop the following components of contemporary middle level schools: appropriate curriculum, interdisciplinary structure, and interdisciplinary teaching.

Prerequisites: EDU 220 (or may be taken concurrently); EDU 240/EDU 241. Corequisites: Must be taken concurrently with EDU 321. Offered: Fall, Spring.

EDU 321 • Integrated Literacy in the Content Areas 1 Credit.

Understanding of literacy development strategies and the role of reading in teaching content material related to specific subject areas. Review of content area texts, assessment and practice in adapting content materials to student needs.

Prerequisites: EDU 220 (may be taken concurrently); EDU 240; 241. Corequisites: Must be taken concurrently with EDU 320. Offered: Fall, Spring.

EDU 331 • Teaching and Learning 3 Credits.

Provides a foundational knowledge of learning psychology and teaching methodology. Examines unique considerations for youth and adult learners, metacognition, formal/informal learning, multi-modal learning, learning in a variety of fields/context, and iterative program assessment.

Corequisites: EDU 332. Offered: Fall, even # years.

EDU 332 • Teaching and Learning Field Experience 1 Credit.

Teaching and Learning occurs in every field of practice to pass along skill and expertise. Students work with the instructor to find shadowing field experiences where teaching

and learning occur in a field of interest and in conjunction with EDU 331.

Corequisites: EDU 331. Offered: Fall, even # years.

EDU 340 • Parent Child and Family Relationships 3 Credits.

The family as a social/cultural unit with emphasis on the parents' interaction with the developing child. Parent-child relations, parenting skills, family systems, and family structure and function.

Offered: Spring.

EDU 342 • Observation, Assessment, Adaptation, and Referral in Early Childhood 4 Credits.

Strategies used in early childhood settings to observe and assess young children's development and to design goals and experiences based upon those assessments. Issues of early identification, referral to special services, building effective parent/professional partnerships, and programming in inclusive early childhood classrooms are discussed.

Prerequisites: EDU 200; EDU 201; EDU 292; EDU 293; admission to the education program. Offered: Fall

EDU 344 • Health, Nutrition, and Safety with Young Children 2 Credits.

Issues in health, nutrition, and safety as related to early childhood settings, birth through age six.

Prerequisites: EDU 200; EDU 201; EDU 292; EDU 293. Offered: Spring

EDU 350 • Infant and Toddler Care 3 Credits.

Strategies used in early childhood settings to assess infant/toddler development and needs, develop goals, and design appropriate learning experiences and environments. Building positive relationships with infants/toddlers and their parents in group settings.

Prerequisites: EDU 200; EDU 201; EDU 292; EDU 293; EDU 306; EDU 307; EDU 340; admission to the education program. Offered: Fall

EDU 351 • Infant and Toddler Development and Learning Field Experience 1 Credit.

Field experience at the Bethel Child Development Center or approved partner infant and toddler setting to practice strategies learned in EDU 350.

Prerequisites: EDU 200; EDU 201; EDU 292; EDU 293; EDU 306; EDU 307; EDU 340; Admission to the education program. Corequisites: Must be taken concurrently with EDU 350. Offered: Fall.

EDU 363 • Health Curriculum and Methods 1 Credit.

Principles, curriculum, and methods of teaching health in grades K-6. Role of the teacher and

school in responding to the special health needs of elementary-age children.

Prerequisites: EDU 200; EDU 201; Admission to the education program. Offered: Fall, Spring.

EDU 365 • Physical Education Curriculum and Methods 1 Credit.

Principles, curriculum, and methods of teaching physical education in grades K-6.

Prerequisites: EDU 200; EDU 201; Admission to the education program. Offered: Fall, Spring.

EDU 366A • Visual Arts Curriculum and Methods 1 Credit.

Methods, materials, and resources for teaching visual arts in grades K-6.

Prerequisites: EDU 200; EDU 201; Admission to the education program. Offered: Fall, Spring.

EDU 368A • Music Curriculum and Methods 1 Credit.

Methods, materials, and resources for teaching music in grades K-6.

Prerequisites: EDU 200; EDU 201; Admission to the education program. Offered: Fall, Spring.

EDU 370 • Math Curriculum and Methods 3 Credits.

Methods, materials, and resources for teaching mathematics in grades K-6. Emphasis placed on problem solving, inquiry, and conceptual understanding in a standards-based classroom.

Prerequisites: EDU 200; EDU 201; EDU271-275; EDU 317GZ; MAT202M; NAS 101D; NAS 102D; NAS 103D; NAS 104D; Admission to the education program. Corequisites: Must be taken concurrently with EDU 371; EDU 372; EDU 373; EDU 374; EDU 375; EDU 376. Offered: Fall, Spring.

EDU 371 • Science Curriculum and Methods 3 Credits.

Methods, materials, and resources for teaching science in grades K-6. Emphasis placed on inquiry and discovery learning, planning, and teaching in a standards-based classroom.

Prerequisites: EDU 200; EDU 201; EDU271-275; EDU 317GZ; MAT202M; NAS 101D; NAS 102D; NAS 103D; NAS 104D; Admission to the education program. Corequisites: Must be taken concurrently with EDU 370; EDU 372; EDU 373; EDU 374; EDU 375; EDU 376. Offered: Fall, Spring.

EDU 372 • Educational Psychology 3 Credits.

Psychological foundations of education continued from EDU 271 with an emphasis on grades 4-6. Various aspects of growth and development, the nature and conditions of learning, implications for teaching, awareness of student variability, and strategies for meeting

the needs of students with disabilities. Teacher/student relationships and strategies for maintaining a classroom environment where learning can occur.

Prerequisites: EDU 200; EDU 201; EDU271-275; EDU 317GZ; MAT202M; NAS 101D; NAS 102D; NAS 103D; NAS 104D; Admission to the education program.
Corequisites: Must be taken concurrently with EDU 370; EDU 371; EDU 373; EDU 374; EDU 375; EDU 376. Offered: Fall, Spring.

EDU 373 • Reading/Language Arts Curriculum and Methods 3 Credits.

Reading methods and processes with a strong emphasis on comprehension and vocabulary development. Language arts skills: writing process, grammar, spelling, drama, listening and speaking skills, viewing skills for students in grades 4-6. A variety of creative and critical response modes to integrate literature across the curriculum.

Prerequisites: EDU 200; EDU 201; EDU271-275; EDU 317GZ; MAT202M; NAS 101D; NAS 102D; NAS 103D; NAS 104D; Admission to the education program.
Corequisites: Must be taken concurrently with EDU 370; EDU 371; EDU 372; EDU 374; EDU 375; EDU 376. Offered: Fall, Spring.

EDU 374 • Social Studies Curriculum and Methods: Planning 3 Credits.

Methods, materials, and resources for teaching social studies in grades K-6. Emphasis placed on the use of process skills of the social scientist. Long- and short-term planning including integration of curriculum across content areas, embedding Minnesota Graduation Standards.

Prerequisites: EDU 200; EDU 201; EDU271-275; EDU 317GZ; MAT202M; NAS 101D; NAS 102D; NAS 103D; NAS 104D; Admission to the education program.
Corequisites: Must be taken concurrently with EDU 370; EDU 371; EDU 372; EDU 373; EDU 375; EDU 376. Offered: Fall, Spring.

EDU 375 • Integrating Technology in the Content Areas 2 Credits.

Methods of integrating technology in various grade levels and content areas are examined. Students design, implement, and access strategies for assessment and learning. Emphasis on approaches to enhance student learning, increase motivation, and link to effective instructional strategies. Professional growth/development and developing digital citizenship/responsibility are considered.

Prerequisites: EDU 200; EDU 201; EDU271-275; EDU 317GZ; MAT202M; NAS 101D; NAS 102D; NAS 103D; NAS 104D; Admission to the education program.

Corequisites: Must be taken concurrently with EDU 370; EDU 371; EDU 372; EDU 373; EDU 374; EDU 376. Offered: Fall, Spring.

EDU 376 • Intermediate Grade Practicum 1 Credit.
Application of effective practices done in a 3rd-6th grade classroom, working with large groups as well as small groups, adapting lessons for students with special needs. Special focus on integrated planning.

Prerequisites: EDU 200; EDU 201; EDU271-275; EDU 317GZ; MAT202M; NAS 101D; NAS 102D; NAS 103D; NAS 104D; Admission to the education program.
Corequisites: Must be taken concurrently with EDU 370; EDU 371; EDU 372; EDU 373; EDU 374; EDU 375. Offered: Fall, Spring. *Special Notes:* A residency option is available by application. Residents stay in the same cooperating classroom for Block 2 and student teaching.

EDU 400 • Methods in Teaching K-12 English to Speakers of Other Languages 3 Credits.

Theories of language learning, language acquisition, and classroom methodologies at the elementary and secondary levels. Exploration of instructional resources, uses of technology, evaluative procedures, and classroom management. Development of a philosophy of English as a Second Language education and practice in unit planning and teaching.

Prerequisites: LIN 210Z; LIN 300; admission to the education program. Offered: Fall.

EDU 401 • Middle Level Education Practicum in TESL 1 Credit.

Classroom-based practicum in an ESL class of young adolescent learners. Emphasizes evaluation and application of concepts and strategies introduced in EDU 400.

Corequisites: Must be taken concurrently with EDU 400. Offered: Fall.

EDU 406 • Methods in Teaching 5-8 English 3 Credits.

An examination of how middle level philosophy translates into practice in English classes in grades 5-8. It is designed to accompany a 1 credit practicum experience in a middle level school.

Prerequisites: EDU 240 and EDU 241 OR EDU 271, EDU 272, and EDU 273. *Corequisites:* Must be taken concurrently with EDU 407. Offered: Spring.

EDU 407 • Middle Level Education Practicum in English 1 Credit.

Classroom-based practicum in an English class of young adolescent learners. Emphasizes evaluation and application of concepts and strategies introduced in EDU 408.

Prerequisites: EDU 240/EDU 241. Corequisites: Must be taken concurrently with EDU 406 or EDU 408. Offered: Spring

EDU 408 • Methods in Teaching 5-12 English 3 Credits.

Methods and curriculum employed in teaching English in middle and high schools. Examines current technology in English education as well as interactive learning and teaching. Emphasizes vocabulary and academic language. Lesson and unit planning using best practices and developmentally appropriate principles.

Prerequisites: EDU 240; EDU 241; admission to the education program. Corequisites: Must be taken concurrently with EDU 407; strongly recommended for EDU 320. Offered: Spring

EDU 410 • Methods in Teaching 5-8 Mathematics 3 Credits.

Teaching methodologies, materials, assessment, historical and current trends and issues in curricular, development of a philosophy of mathematics education, and other topics related to teaching and learning mathematics in grades 5-8. Practice in planning lessons and units, implementing technology, and teaching.

Prerequisites: EDU 240 and EDU 241 OR EDU 271, EDU 272, and EDU 273; Admission to Education program. Corequisites: Must be taken concurrently with EDU 411. Offered: Fall.

EDU 411 • Mathematics Education Practicum in grades 5-8 or 5-12 1 Credit.

Students observe and participate in a high school and/or middle school mathematics classroom (minimum 40 hours on site). Develop deeper understanding of preadolescent and adolescent learners as well as curriculum, instruction, and assessment in the context of grades 5-12 school communities.

Prerequisites: EDU 240; EDU 241; admission to the education program. Corequisites: Must be taken concurrently with EDU 412. Offered: Fall

EDU 412 • Methods in Teaching 5-12 Mathematics 3 Credits.

Teaching methodologies, materials, assessment, historical and current trends and issues in curriculum, development of a philosophy of mathematics education, and other topics related to teaching and learning mathematics in grades 5-8 and 9-12. Practice in planning lessons and units, implementing technology, and teaching.

Prerequisites: EDU 240; EDU 241; admission to the education program; senior standing or permission of

instructor. Corequisites: Must be taken concurrently with EDU 411. Offered: Fall

EDU 413 • Methods in Teaching K-12 Art 3 Credits.

Materials, methods, and curriculum employed in teaching art at both the elementary and secondary levels. Historical survey of philosophy of art education and present trends. Studio time for exploration and application of media suitable for both elementary and secondary levels.

Prerequisites: EDU 240; EDU 241; Admission to the Education program. Corequisites: Registration in EDU 414 is required. Offered: Fall.

EDU 414 • Middle Level Education Practicum in Art 1 Credit.

Classroom-based practicum in an art class of young adolescent learners. Emphasizes evaluation and application of concepts and strategies introduced in EDU 413.

Prerequisites: EDU 240; EDU 241. Corequisites: Must be taken concurrently with EDU 413. Offered: Fall.

EDU 418 • Methods in Teaching 9-12 Social Studies 2 Credits.

Development of ability to take concepts from several component disciplines of social studies and communicate them effectively to, or direct their acquisition by, students in grades 9-12. Curriculum trends, materials, classroom methodologies, and teacher competencies are studied and applied.

Prerequisites: EDU 240; EDU 241; admission to the education program. Corequisites: Must be taken concurrently with EDU 419. Offered: Spring

EDU 419 • 5-8 Social Studies Methods and Practicum 2 Credits.

Classroom-based practicum in a social studies class of young adolescent learners. Emphasizes evaluation and application of concepts and strategies introduced in EDU 418.

Prerequisites: EDU 240/EDU 241; EDU 220. Offered: Spring. Special Notes: Social studies 5-12 majors may take concurrently with EDU 418.

EDU 420 • Methods in Teaching 5-12 Science 3 Credits.

Current methods and approaches used in the teaching of science in grades 5-12. Examination of ways to develop and present curriculum with emphasis on content, scientific investigation, inquiry, assessment, and safe laboratory practices.

Prerequisites: EDU 240; EDU 241; admission to the education program. Offered: Fall. Special Notes: Requirements for this course are fulfilled through

EDUC 681 Methods of Teaching 5-12 Science, which is taught in conjunction with the Bethel University Graduate School.

EDU 422 • Curriculum and Methods of 5-12 Health Education 3 Credits.

Exploration of the science and art of teaching health. Includes the skills of planning units, teaching lessons, writing measurable objectives, and evaluating lessons for students in grades 5-12 and the community. Major focus on learning and applying various teaching methods and strategies to the content areas within health education.

Prerequisites: EDU 240; EDU 241; HAS 130; HAS 340; Admission to the Education program. Offered: Fall.

EDU 423 • Middle Level Education Practicum in Health 1 Credit.

Classroom-based practicum in a health education class of young adolescent learners. Emphasizes evaluation and application of concepts and strategies introduced in EDU 422.

Prerequisites: HAS 130; HAS 340. Offered: Fall.

EDU 424 • Methods in Teaching K-12 Physical Education 3 Credits.

Instructional process in physical education, grades K-12. Observation and practice of teaching skills and strategies, including: planning and delivering content, managing a class, and monitoring student progress.

Prerequisites: EDU 240; EDU 241; HAS 316 or consent of instructor; admission to the education program. Offered: Fall.

EDU 425 • Middle Level Practicum in Physical Education 1 Credit.

Classroom-based practicum in a physical education class of young adolescent learners. Emphasizes evaluation and application of concepts and strategies introduced in EDU 424.

Prerequisites: EDU 240; EDU 241; HAS 247; HAS 316. Corequisites: Must be taken concurrently with EDU 424. Offered: Fall.

EDU 426 • Methods in Teaching K-12 World Languages and Cultures 3 Credits.

Theories of language acquisition, language learning, and classroom methodologies at the elementary and secondary levels. Exploration of instructional resources, uses of technology, evaluative procedures, and classroom management. Development of a philosophy of communicative language teaching and practice in unit planning and teaching.

Prerequisites: EDU 240; EDU 241; Admission to the Education program; Demonstration of Intermediate-High oral proficiency after study abroad via the OPIC or consent of instructor, or a major or minor offered through the World Languages and Cultures Department. Offered: Fall.

EDU 427 • Middle Level Education Practicum in World Languages and Cultures 1 Credit.

Classroom-based practicum in a Spanish class of young adolescent learners. Emphasizes evaluation and application of concepts and strategies introduced in EDU 426.

Prerequisites: EDU 240/241. Corequisites: Must be taken concurrently with EDU 426. Offered: Fall.

EDU 428 • Methods in Teaching 5-8 Science 2 Credits.

Current methods and approaches used in the teaching of science in grades 5-8. An examination of ways to develop and present curriculum with emphasis on assessment, instructional strategies, scientific investigations, safety training, and current issues in science education.

Prerequisites: Admission to the education program; EDU 271, EDU 272, EDU 273, EDU 274, and EDU 275. Corequisites: Must be taken concurrently with EDU 429. Offered: Fall

EDU 429 • Science Education Practicum in Grades 5-8 or 5-12 1 Credit.

Students observe and participate in a high school and/or middle school science classroom (minimum 40 hours on site). Develop deeper understanding of preadolescent and adolescent learners as well as curriculum, instruction, and assessment in the context of grades 5-12 school communities.

Prerequisites: EDU 240/241; admission to the education program. Corequisites: Must be taken concurrently with EDU 420. Offered: Fall

EDU 432 • Methods in Teaching Elementary Music 3 Credits.

Methods and materials for teaching music in the elementary school. The skills of singing, playing, moving, improvising, reading, and listening are explored as a means of helping children gain an intuitive and theoretical understanding of musical principles.

Prerequisites: EDU 240; EDU 241; major or minor in music; admission to the education program. Offered: Fall

EDU 433 • Methods in Teaching Secondary Music 3 Credits.

Methods and materials for teaching music in the middle school, junior high, and high school vocal and instrumental programs.

Prerequisites: EDU 432; major or minor in music; admission to the education program. Offered: Spring

EDU 434 • Middle Level Education Practicum in Music 1 Credit.

Classroom-based practicum in a music class of young adolescent learners. Emphasizes evaluation and application of concepts and strategies introduced in EDU 433.

Prerequisites: EDU 432; major or minor in music. *Corequisites:* EDU 433. Offered: Spring

EDU 489 • Student Teaching in Preprimary 3 Credits.

Observation and student teaching in a pre-k setting in which a student will be licensed to teach. Includes participation in a seminar.

Prerequisites: EDU 292/293, EDU 306/307; EDU 340; EDU 342; EDU 344; Admission to student teaching. Offered: Fall, Spring, Interim, Summer (depending on faculty availability).

EDU 490 • Student Teaching Block 1-15 Credits.

Observation and student teaching at appropriate level(s) for specified period(s). Includes participation in a seminar that meets regularly. Students earning a license to teach in two teaching majors must register for EDU 490 in the primary license and in the second license. Both student teaching placements can occur within the same semester. Some situations may require the addition of student teaching during Interim. Student teaching semester also includes a weekly seminar meeting by program. Students should communicate with their supervisors about meeting times and locations.

Prerequisites: Admission to student teaching; 2.50 GPA. *Special Notes:* Graded on an S/U basis. Offered: Fall, Spring.

EDU 491 • Student Teaching in Middle Level 3 Credits.

Observation and student teaching in fields in which a student will be licensed to teach. This involves student teaching in a Middle Level endorsement area.

Prerequisites: Admission to student teaching. *Special Notes:* Graded on an S/U basis. Offered: Fall, Spring.

MAT 101M • Mathematics for the 21st Century 3 Credits.

Mathematical ideas that a liberally educated person should be familiar with in order to function well in a technological society.

Prerequisites: Two years of high school algebra, including logarithms and exponential functions. Offered: Fall, spring

MAT 102M • Creative Problem Solving 3 Credits.

An opportunity to learn to use creative thinking and intuition to gain confidence in understanding and solving some intriguing problems in mathematics.

Prerequisites: High school algebra and geometry. Offered: Interim

MAT 123M • Precalculus 3 Credits.

Mathematics topics required for MAT 124M or for further study in the natural sciences. Equations and inequalities; graphs of functions and relations; polynomial, rational, exponential, logarithmic functions; trigonometric functions, identities, equations, and applications.

Prerequisites: Two years of high school algebra; satisfy math department placement requirements. Offered: Fall, spring

MAT 124M • Calculus 1 4 Credits.

A mathematical foundation for future college courses and beyond. An introduction to the concepts and methods of the derivative and the integral, and a demonstration of how they are applied in real-world modeling situations. Topics are examined graphically, numerically, and algebraically, including using a symbolic computer algebra system to aid with understanding.

Prerequisites: MAT 123M or equivalent high school or college course(s); satisfy math department placement requirements. Offered: Fall, spring

MAT 125 • Calculus 2 4 Credits.

A continuation of the equipping of students with tools for effective problem solving. Study of integration, sequences and series, and introduction to differential equations and approximation techniques. Each topic is approached from several viewpoints (graphical, numerical, algebraic) to involve students with different learning styles.

Prerequisites: MAT 124M. Offered: Fall, spring

MAT 201M • Mathematics for Elementary Education 1 3 Credits.

Introduction to problem solving; patterns and sequences; systems of numeration; sets and logic; concepts, operations, and algorithms for

each subset of the real numbers; elementary number theory; concepts and applications of ratios, proportions, and percents.

Prerequisites: Major in Elementary Education; minimum ACT mathematics score of 24, minimum SAT mathematics score of 560, or satisfactory completion of Bethel's online Math for Elementary Education prep course; 15 college-level credits completed. *Special Notes:* MAT 201M may not be used to fulfill the requirements for a major or minor in Mathematics; Offered: Fall, Spring.

MAT 202 • Mathematics for Elementary Education 2 3 Credits.

Problem-solving and reasoning strategies; algebraic expressions, equations, and functions; data analysis, statistics, combinations/permutations, and probability; concepts and applications of two- and three-dimensional geometry and measurement.

Prerequisites: Grade of C or higher in MAT 201M. MAT 202 may not be used to fulfill the requirements for a major or minor in mathematics. Offered: Fall, spring

MAT 207M • Statistical Analysis 3 Credits.

Descriptive and inferential statistics. Specific topics include discrete probability spaces, random variables, distributions, normal distribution, estimation, hypothesis testing, linear regression, correlation analysis. Selected topics could include analysis of variance, goodness-of-fit, and contingency tables. Applications to business, economics, and science.

Offered: Fall, Interim, Spring. *Special Notes:* Students may not receive credit for both MAT 207M and PSY 230M.

MAT 209 • Financial Mathematics for Actuarial Science 3 Credits.

Topics and problem-solving practice for the actuarial exam in financial mathematics. Theory of interest topics include: time value of money, annuities, cash flows, amortized loans, bonds, portfolios, and immunization. Financial economics topics include: derivatives, options, forwards and futures, swaps, hedging, and investment strategies.

Prerequisites: MAT 125. Offered: Occasionally.

MAT 211 • Linear Algebra 3 Credits.

Linear systems, matrices, vectors and vector spaces, linear transformations, inner products, norms, eigenvalues and eigenvectors, orthogonality, and applications. Provides a foundation for many areas of study in mathematics, computer science, engineering, and science.

Prerequisites: MAT 125 or MAT 241. Offered: Fall, spring.

MAT 222 • Differential Equations 3 Credits.

Analytic solution methods for ordinary differential equations, including special methods for first- and second-order systems, and transformation methods. Analysis of systems of differential equations using linear algebra and qualitative phase plane techniques.

Prerequisites: MAT 125. MAT 223 strongly recommended. Offered: Spring

MAT 223 • Multivariable Calculus 3 Credits.

Differential calculus of real functions on \mathbb{R}^n : limits, continuity, partial and directional derivatives, mean value theorem, implicit functions, Taylor's Theorem, and optimization techniques (including Lagrange multipliers). Multiple integral theory: change of variables, iterated integrals, and line integration (Green's Theorem).

Prerequisites: MAT 125. Offered: Fall, Spring.

MAT 241 • Discrete Mathematics 3 Credits.

Covers a collection of topics useful to mathematics and computer science majors. The unifying factor is that the topics deal mainly with finite collections of mathematical objects (graphs, trees, finite state machines, etc.). Also includes examination of sets, logic, Boolean algebras, proof techniques, algorithm analysis, counting, and recursion.

Prerequisites: MAT 124M. Offered: Fall

MAT 310 • Algebraic Structures 4 Credits.

Study of groups, rings, fields, and applications of these algebraic structures from a firm axiomatic foundation with a strong emphasis on properly written proofs.

Prerequisites: MAT 211. Offered: Spring

MAT 330 • Probability and Statistics 3 Credits.

Discrete and continuous probability spaces, distribution and density functions, random variables, sampling, expectation, estimation, and hypothesis testing.

Prerequisites: MAT 125. Offered: Fall

MAT 331 • Applied Statistics 3 Credits.

Linear and multilinear regression. Factor analysis, including analysis of variance and experimental design.

Prerequisites: MAT 330 or consent of instructor. Offered: Spring, even # years

MAT 344 • Numerical Methods 3 Credits.

Numerical methods for solving systems of linear equations, finding roots and fixed points,

approximating data and functions, numerical integration, finding solutions to differential equations.

Prerequisites: MAT 211 or MAT 222. *Recommended:* COS 105 or COS 205. *Offered:* Spring. *Special Notes:* Carries cross-credit in computer science.

MAT 351 • Modern Geometry 3 Credits.

A survey of informal and formal geometric topics. Investigation of concepts, structure, proof, Euclidean, non-Euclidean, and transformational geometry.

Prerequisites: MAT 241 or consent of instructor. *Offered:* Fall, even # years. *Special Notes:* Designed for students seeking licensure to teach math in grades 5-12.

MAT 376 • Operations Research 4 Credits.

Mathematical techniques used in systems analysis, including linear programming, simulation techniques, and other topics such as transportation models, integer programming, and network analysis.

Prerequisites: COS 105 or COS 205; MAT 211. *Offered:* Fall, odd # years.

MAT 422 • Real Analysis 3 Credits.

Elementary set theory, properties of real numbers, functions of real variables, sequences, series, differentiation, Riemann integration, and introduction to topological concepts.

Prerequisites: MAT 223; MAT 310. *Offered:* Fall.

MAT 425 • Topics in Mathematics 3 Credits.

A seminar designed to provide an in-depth experience with a specific field of mathematics.

Topics vary from semester to semester and include logic, number theory, dynamical systems, chaos and fractals, complex analysis, partial differential equations and Fourier analysis, intermediate probability and statistics, combinatorics, and topology.

Corequisites: MAT 310 or consent of instructor. *Offered:* Spring, odd # years.

MAT 499 • Foundations of Mathematics 3 Credits.

A short history of mathematics' major transition points, overview of foundations of mathematics, axiomatic structures, and philosophies of mathematics in relation to Christian faith.

Prerequisites: Major in mathematics; Senior standing. *Offered:* Interim.