Undergraduate Minor in Education

The Graduate School of Education offers a minor especially designed for those students who are considering a career as an elementary teacher. We also offer a minor for students who are generally interested in education or who might consider entering middle of high school teaching. A fast track into teaching is available with the minor for students considering middle or high school teaching; contact Dr. Ossen at the beginning of your senior year.

- Both minors in education consists of 18 credits.
- All course pre-requisites must be satisfied.
- Freshmen are not eligible to begin the minor.
- Students will be required to complete a CORI (Criminal Offender Record Information) background check in order to visit or work in classrooms.

For information contact Dr. John Brown
510 O'Leary Library
978-934-4604
E-mail: John_Brown@uml.edu

Elementary Education Minor (18 credits)

<table>
<thead>
<tr>
<th>Required Courses</th>
<th>12 credits</th>
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</thead>
<tbody>
<tr>
<td>92.107 Elementary Math for Teaching: Numbers and Operations</td>
<td>3 credits</td>
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<tr>
<td>92.227 Elementary Math for Teaching: Geometry and Measurement</td>
<td>3 credits</td>
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<tr>
<td>02.401 Exploring Teaching</td>
<td>3 credits</td>
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<tr>
<td>01.384 Language, Literacy and Culture</td>
<td>3 credits</td>
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</tbody>
</table>

Electives Choose from:

| 01.373 Teaching and Learning with Technology | 3 credits |
| 01.371 Educational Psychology              | 3 credits |
| 01.391 Understanding Education             | 3 credits |
| 02.301 JUMPSTART - both courses must be taken | 6 credits |
| Early Literacy Community Experience I     | 3 credits |
| Early Literacy Community Experience II     | 3 credits |

Education Minor (18 credits)

<table>
<thead>
<tr>
<th>Required Courses</th>
<th>15 credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>01.384 Language, Literacy and Culture</td>
<td>3 credits</td>
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<td>01.373 Teaching and Learning with Technology</td>
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<td>3 credits</td>
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</tbody>
</table>

Electives

| 3 credits only                       |

One three credit course chosen with approval of Dr. Brown.

Electives for seniors accepted into the middle/secondary fast track to teaching (apply during the fall semester of your senior year after discussion with Dr. Brown) Choose from:

| 01.501 Teaching Diverse Populations  | 3 credits |
| 01.502 Adolescent Development and Learning | 3 credits |

UTeach UMass Lowell - STEM Teaching Minor

For more information visit UTeach.

- Exploratory Courses
- STEM Teaching Minor
- UTeach Courses

UTeach is an innovative program that prepares math, science, engineering and computer science students to become middle school or high school teachers. Teaching is a rewarding career, and this minor provides STEM majors with the opportunity to find out whether teaching is for them. The program is open to science, math, computer science and engineering students. Students begin by taking two, 1 credit courses (UTL 101 and UTL 102) commonly known as Step 1 and Step 2. The courses provide students with classroom experience and the opportunity to find out what teaching is like without committing to a full program.
Students who choose to enter the STEM TEACHING MINOR, take 24 credits of course work which, if completed successfully, will provide them with an initial teaching license to become employed as a teacher after graduation. Students therefore have a bachelor’s degree in their STEM field, a STEM teaching minor and a Massachusetts teaching license.

The UTeach program (which includes Step 1, Step 2 and the STEM Teaching minor) is an innovative model developed at the University of Texas Austin. UTeach UMass Lowell was launched in spring 2012 under a $1.6 million Massachusetts Department of Education grant. UMass Lowell is the only university in New England to offer the UTeach program.

<table>
<thead>
<tr>
<th>Exploratory Courses (do not count toward minor)</th>
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</thead>
<tbody>
<tr>
<td>Step 1: Inquiry Approaches to Teaching</td>
</tr>
<tr>
<td>Step 2: Inquiry-Based Lesson Design</td>
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</tbody>
</table>

| STEM Teaching Minor (24 credits)             |
| *Knowing & Learning in Math & Science       | Credits: 3, Semester: Fall |
| *Perspectives on Mathematics & Science      | Credits: 3, Semester: Spring |
| Interactions and Equity                     | Credits: 3, Semester: Spring |
| Project-Based Instruction                   | Credits: 3, Semester: Fall |
| Research Methods                            | Credits: 3, Semester: Fall |
| Teaching English Language Learners          | Credits: 3, Semester: Fall |
| Practicum                                   | Credits: 6, Semester: Spring |

*These courses are Gen Ed approved

In addition to the above courses, Math and Computer Science majors** must also take the following course which for math majors is an elective in their math degree:

| Functions and Modeling                      | Credits: 3, Semester: Fall |

**Math and Computer Science majors are also required to have a course in Geometry

Please visit the UTeach website for further information, call the UTeach offices at Pasteur 106, or contact the UTeach faculty: Sumudu Lewis: Sumudu_Lewis@uml.edu or Irene Martin: Irene_Martin1@uml.edu.

UTEACH COURSES

SCIENCE, TECHNOLOGY-ENGINEERING AND MATHEMATICS TEACHING

**UTL 101 - Step 1: Inquiry Approaches to Teaching (1 credit)**
This course provides students with an introduction to teaching in order for them to explore a career as a middle or high school math or science teacher. During the course, student-pairs teach math and/or science lessons in a local elementary school classroom and receive feedback from a mentor teacher. Additionally, students are introduced to the theory and practice that is necessary to design and deliver excellent instruction. This course is the first step for students interested in exploring the STEM TEACHING MINOR with UTeach UMass Lowell.

Pre/Co-requisites: Math, Science & Engineering Majors only.

**UTL 102 - Step 2: Inquiry Based Lesson Design (1 credit)**
Students who are exploring teaching as a career become familiar with the middle school setting by observing and discussing the middle school environment, and by teaching several lessons in a middle school classroom. They build upon and practice lesson design skills that were developed in Step 1 and also become familiar with excellent science and mathematics curricula for the middle school setting.

Pre-requisite: UTL101

**UTL 201 - Knowing and Learning in Mathematics and Science (3 credits)**
(General Education Social Sciences for all undergraduates)
The course starts by imparting the understanding that there is a science to learning and by having students examine ideas of what it means for an individual to know or understand something. This course focuses on several essential questions which enable students to explore how knowing and learning are structured with specific emphasis on mathematics and science. Students will come to understand what it means to know something, how we can understand student thinking and how theories of learning inform instructional decisions; in particular students will explore the idea that learning is a social activity. Students are prompted to reflect on their own ways of looking at various ideas and concepts and to consider alternative perspectives. Students will conduct an analysis of reasoning processes through a clinical interview process, one-on-one with learners engaging in problem solving. This course is required for the STEM TEACHING MINOR.

**UTL 202 - Interactions and Equity (3 credits)**
This course examines the organization of instructional settings that maximize learning for all. Students will examine gender issues, cultural issues, bilingual education and learning disabilities as they impact learner success. A major portion of the course is a field experience in which students interview high school teachers, observe a high school classroom, then teach three lessons. The purpose of these experiences is to ensure that students recognize the diversity of students and their specific learning needs. This course is required for the STEM TEACHING MINOR.
Pre-requisites: UTL.101, UTL.102, and UTL.201

UTL 204 - Perspectives on Mathematics and Science (3 credits)  
(General Education Humanities for all undergraduates)  
This course examines the history and philosophy of mathematics and science. Students will explore a selection of topics and episodes in the history of science and mathematics recognizing that many gains in knowledge have emerged through struggle, and in spite of resistance from cultural, religious and social structures. Students will learn that ideas in science and mathematics are dynamic and that disagreement can often lead to major breakthroughs. Students must think critically about how K-12 STEM education texts portray the history and philosophy of science and mathematics. This course is required for the STEM TEACHING MINOR.

UTL 301 - Project-based Instruction (3 credits)  
This is a key component of the minor as it engages students in designing, implementing and employing a project-based curriculum. Students will observe project-based learning in high schools, before creating and leading their own field-based unit. The unit must incorporate major components of project-based learning, namely collaboration, formulating questions, making predictions, designing investigations, collecting and analyzing data, making products and sharing ideas. This course is required for the STEM TEACHING MINOR.

Pre-requisites UTL 201 and 202

UTL 302 - Research Methods for STEM Inquiries (3 credits)  
The goal of this course is to provide students with an understanding of and the ability to use tools that scientists use to solve problems. Students will also learn how scientists communicate their findings and engage in peer-review. Students design and carry out four independent inquiries, which they write up and present in the manner that is common in the scientific community. Students will work in multi-disciplinary teams. The course is divided between class and lab sessions, but is primarily lab-based. The topics of the class sessions are: Curiosity and Scientific Inquiry, Experimental Design and Analysis, Statistics, Modeling, Presenting Scientific Information. Students conduct their inquiries, incorporate statistics to interpret their results and present their scientific work orally. This course is required for the STEM TEACHING MINOR.

UTL 401 - Practicum (6 credits)  
This is the culminating experience in the STEM TEACHING MINOR and includes a biweekly seminar. Students are required to spend 12 weeks (minimum) teaching a STEM subject in a middle or high school. Candidates are required to have (i) declared the STEM TEACHING MINOR, (ii) passed both MTEL examinations and (iii) maintained an overall GPA of 2.5.

Pre-requisites: All UTL courses and 92.210 (Math and Computer Science only).

UTL 441 - Teaching English Language Learners (3 credits)  
The purpose of this course is to prepare new teachers with the knowledge and skills to effectively shelter their content instruction, so that the growing population of English language learners (ELLs) in K-12 schools can achieve academic success, and contribute their multilingual and multicultural resources. The course will provide aspiring teachers with practical research-based protocols, methods, and strategies to integrate subject area content, language, and literacy development. Successful completion of this course provides the SEI (Sheltered English Immersion) endorsement required for teaching in the Commonwealth of Massachusetts.

Pre-requisites: UTL 301 and Must be taken in the senior year prior to the practicum

92.210 - Functions and Modeling (3 credits - Math and Computer Science majors only)  
Engage in lab-based activities designed to strengthen their problem-solving skills and expand knowledge of the topics in secondary mathematics, focusing especially on topics from precalculus and the transition to calculus. Explore a variety of contexts that can be modeled using families of functions. Topics include conic sections, parametric equations and polar equations. Multiple representations, transformations, data analysis techniques and interconnections among geometry, probability and algebra. Quantitative approaches and building relationships between discrete and continuous reasoning will be recurrent themes.

01.371 Educational Psychology  
Course ID: 2310  
Course Details: An introduction to the study of human learning, this course covers topics such as efficiency in learning, testing, the psychology of learning, and theories of learning. For undergraduates only.

Max Credits: 3  
Min Credits: 3

01.391 Understanding Education  
Course ID: 2313  
Course Details: The aim of the course is to assist students to build knowledge about educational structures and roles in diverse settings as they consider how education could figure as a calling. Using a broad range of inquiry methodologies and technologies, students will
explore areas of self-selected interest in formal educational settings (K-12 or higher education) or informal educational settings (community or health settings, policy, etc.). These explorations will culminate in case presentations in the form of digital stories, in which students will share their findings and discuss future goals in the area of education.

Max Credits: 3
Min Credits: 3

**UTL.101 STEP 1: Inquiry Approaches to Teaching**

Course ID: 37449

Course Details: This course provides students with an introduction to teaching in order for them to explore a career as a middle or high school math or science teacher. During the courses, students pairs teach math and/or science lessons in a local elementary school classroom and receive feedback from a mentor teacher. Additionally, students are introduced to the theory and practice that is necessary to design and deliver excellent instruction. This course is the first step for those students interested in exploring the STEM TEACHING MINOR with UTeach UMass Lowell.

Max Credits: 1
Min Credits: 1

**UTL.102 STEP 2: Inquiry Based Lesson Design**

Course ID: 37450

Course Details: Students who are exploring teaching as a career become familiar with the middle school setting by observing and discussing the middle school environment, and by teaching several lessons in a middle school classroom. They build upon and practice lesson design skills that were developed in Step 1 and also become familiar with excellent science and mathematics curricula for the middle school setting.

Max Credits: 1
Min Credits: 1

**UTL.201 Knowing and Learning in Math and Science**

Course ID: 37642

Course Details: The course starts by imparting the understanding that there is a science to learning and by having students examine ideas of what it means for an individual to know or understand something. This course focuses on several essential questions which enable students to explore how knowing and learning are structured with specific emphasis on mathematics and science. Students will come to understand what it means to know something, how we can understand student thinking and how theories of learning inform instructional decisions; in particular students will explore the idea that learning is a social activity. Students are prompted to reflect on their own ways of looking at various ideas and concepts and to consider alternative perspectives. Students will conduct an analysis of reasoning processes through a clinical interview process, one-on-one with learners engaging in problem solving. This course is required for the STEM TEACHING MINOR.

Max Credits: 3
Min Credits: 3

**01.373 Teaching and Learning with Technology**

Course ID: 2311

Course Details:

Max Credits: 3
Min Credits: 3

**02.301 Early Literacy Community Experience I**

Course ID: 37208

Course Details: This is Part One of a two semester course that focuses on experiential learning associated with the Jumpstart Program. The course provides students in the education minor with the necessary skills for working with children in early childhood community agencies. Topics based on the National Association for the Education of Young Children (NAEYC) Standards which include child development, family and community, assessment, teaching and learning, literacy development, and professionalism will be the focus of the course.
02.302 Early Literacy Community Experience II

Course ID: 37209

Course Details: This is Part Two of a two semester course that enhances the experiential learning of students in the education minor participating in the Jumpstart Program. Building on the knowledge base of the first semester, the course allows students to deepen their understanding of the social, emotional and behavioral needs of children in early childhood settings and reflect on how they have integrated what they learned during the experience.

02.401 Exploring Teaching

Course ID: 31976

Course Details: This course is for third and fourth year undergraduates who are considering teaching as a career. Focusing on students, teachers, classrooms and schools, the course will provide an overview of the historical, philosophical, legal and societal influences that shape education today. Field work in an elementary, middle or high school will be an integral component of the course.

02.420 Elementary Mathematics for Teaching: Numbers and Operations

Course ID: 2374

Course Details: This course examines the topic of Number and Operations for teaching mathematics to Elementary School students. The philosophy and content of this course reflect the National Council of Teachers of Mathematics Curriculum Focal Points for Pre-Kindergarten through Grade 8 Mathematics, as well as the Massachusetts Mathematics Curriculum Frameworks and the Common Core State Standards.

02.443 Methods of Teaching

Course ID: 33179

Course Details: Examines the methods of teaching students with moderate disabilities. Topics include curriculum (including the Massachusetts frameworks), IEPs, and instructional modifications appropriate for students with special needs.

UTL.202 Interactions and Equity

Course ID: 37652

Course Details: This course examines the organization of instructional settings that maximize learning for all. Students will examine gender issues, cultural issues, bilingual education and learning disabilities as they impact learner success. A major portion of the course is a field experience in which students interview high school teachers, observe a high school classroom, then teach three lessons. The purpose of these experiences is to ensure that students recognize the diversity of students and their specific learning needs. This course is required for STEM TEACHING MINOR.

UTL.204 Perspectives on Mathematics and Science

Course ID: 37649
Course Details: This course examines the history and philosophy of mathematics and science. Students will explore a selection of topics and episodes in the history of science and mathematics recognizing that many gains in knowledge have emerged through struggle, and in spite of resistance from cultural, religious and social structures. Students will learn that ideas in science and mathematics are dynamic and that disagreement can often lead to major breakthroughs. Students must think critically about how K-12 STEM education texts portray the history and philosophy of science and mathematics. This course is required for the STEM TEACHING MINOR.

Max Credits: 3
Min Credits: 3

01.384 Language, Literacy and Culture

Course ID: 2312

Course Details: The course examines the role that socio-cultural and socio-political contexts play in children's literacy development, with particular focus on English Language Learners (ELLs). The course is designed to help students understand the complex and dynamic worlds of diverse learners represented in twenty-first century classrooms. Students will learn new and effective approaches to teaching and learning that provides struggling learners, especially English Language Learners a fair and equitable chance to succeed in the learning contexts.

Max Credits: 3
Min Credits: 3

UTL.203 Reading and Writing in Stem Fields

Course ID: 37654

Course Details: This course is designed to meet the Commonwealth of Massachusetts' requirement for secondary content teaching. New teachers must help students become strategic readers of texts and research in STEM disciplines and to communicate their ideas effectively in writing. Students in the course will investigate the complex process of comprehension and design reading strategies for middle and high school students. They will explore the means to assist middle and high school students to be more effective writers both of laboratory type reports and expository passages. The use of technology as a tool to communicate instructional materials and expectation with students and parents will be explored. Throughout the course, students will recognize that academic language must be taught in a way that enables English language learners to master STEM content.

Max Credits: 2
Min Credits: 2

UTL.301 Project-Based Instruction

Course ID: 37650

Course Details: This is a key component of the Minor as it engages students in designing, implementing and employing a project-based curriculum. Students will observe project-based learning in high schools, before creating and leading their own field-based unit. The unit must incorporate major components of project-based learning, namely collaboration, formulating questions, making predictions, designing investigations, collecting and analyzing data, making products and sharing ideas. This course is required for the STEM TEACHING MINOR.

Max Credits: 3
Min Credits: 3

UTL.302 Research Methods

Course ID: 37651

Course Details: The goal of this course is to provide students with an understanding of and the ability to use tools that scientists use to solve problems. Students will also learn how scientists communicate their findings and engage in peer-review. Students design and carry out four independent inquiries, which they write up and present in the manner that is common in the scientific community. Students will work in multidisciplinary teams. The course is divided between class and lab sessions, but is primarily lab-based. The topics of the class sessions are: Curiosity and Scientific Inquiry, Experimental Design and Analysis, Statistics, Modeling, Presenting Scientific Information. Students conduct their inquiries, incorporate statistics to interpret their results and present their scientific work orally. This course is required for the STEM TEACHING MINOR.

Max Credits: 3
Min Credits: 3
UTL.401 Practicum

Course ID: 37653

Course Details: This is the culminating experience in the STEM Teaching Minor and must be taken in conjunction with the one-credit Practicum Seminar*. Students are required to spend 12 weeks (minimum) teaching a STEM subject in a middle or high school. Candidates are required to have (i) declared the STEM teaching minor, (ii) passed both MTEL examinations and (iii) maintained an overall GPA of 2.5.

Max Credits: 6
Min Credits: 6

UTL.402 Practicum Seminar

Course ID: 37655

Course Details: The Practicum Seminar provides a supportive environment where students share their experiences and work on solutions to problems they may be experiencing. Master teachers teach the weekly seminar, share their teaching experiences and facilitate discussions to help students develop their own successful teaching identities. The seminar is an effective forum for students to get the guidance they consistently want on classroom management. Additionally, students must fulfill the requirements determined by the Commonwealth of Massachusetts. The licensure documentation will be discussed, developed and submitted as a requirement of the 1 credit seminar.

Max Credits: 1
Min Credits: 1

UTL.441 Teaching English Language Learners

Course ID: 33080

Course Details: The purpose of this course is to prepare new teachers with the knowledge and skills to effectively shelter their content instruction, so that the growing population of English language learners (ELLs) in K-12 schools can achieve academic success, and contribute their multilingual and multicultural resources. The course will provide aspiring teachers with practical research-based protocols, methods, and strategies to integrate subject area content, language, and literacy development. Successful completion of this course provides the SEI (Sheltered English Immersion) endorsement required for teaching in the Commonwealth of Massachusetts.

Max Credits: 3
Min Credits: 3

02.445 Teaching Reading/English Bilingual Student

Course ID: 2379

Course Details:

Max Credits: 3
Min Credits: 3

01.403 Understanding Child Development in a Diverse Society

Course ID: 36642

Course Details: Examines the major theoretical frameworks of child development and how cultural differences affect development and learning. Focus is on helping students make responsive and culturally relevant pedagogical decisions.

Max Credits: 3
Min Credits: 3

01.405 Children with Disabilities in the Classroom

Course ID: 33095

Course Details: This course examines the nature of cognitive emotional, developmental, sensory, and physical disabilities that compromise student capacity to make adequate academic progress without special intervention. Legal and ethical responsibilities of the educator in inclusive classroom settings and as an active member of a multidisciplinary learning team are emphasized.
Max Credits: 3
Min Credits: 3