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# **Handbook of Graduate Study, Department of Learning and Instruction**

**Science Education**

**Graduate School of Education**

**University at Buffalo**

**State University of New York**

**2018- 2019**

**While this handbook has been developed to assist you throughout your academic program, it does not constitute the whole of UB or GSE policies concerning students. It is the student’s responsibility to be aware of and comply with all policies, procedures and deadlines.**

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**Introduction**

GSE and this department supports and is committed to creating an inclusive learning environment where diverse perspectives are recognized, respected, and seen as a source of strength. Further, we wish to affirm our commitment to creating and maintaining a positive, welcoming, and inclusive environment that embraces diversity and strives to eliminate barriers to access, advancement, and full participation on the basis of race, gender identity, sex, sexual orientation, religion, disability, or veteran status for student, faculty, and staff.

**Department of Learning and Instruction**

***Julie Gorlewski, CHAIR***

**Purpose of Handbook.** This handbook was established to provide you with important information regarding university and department policies and procedures, your responsibilities, obligations and expectations as a student at UB, and UB services and facilities available to you.

**Welcome.** The Department of Learning and Instruction (LAI) provides quality professional education for graduate students pursuing educational careers through the University’s Teacher Education Program, Certificates of Advanced Study, and Certification Master’s and Non-certification Master’s study programs. Certification Tracks of Initial-Only, Initial/Professional, and Professional are available with specified content areas of Early Childhood and/or Childhood, English, English for speakers of other languages, Languages other than English, Literacy Specialist, Mathematics, Music, Science, and Social Studies with an option of in-person, online-only, or blended study. In addition, the department offers an undergraduate minor and combined programs through its UBTeach Initiative.

***Detailed information about the Science Education program can be found on page 12 of this handbook.***

**Department Vision: Transforming Lives Through Critical Learning**

We take education to be a vital aspect of the transmission, construction, and transformation of culture and society. As researchers, teachers, and mentors, we prepare professional educators and scholars for colleges and universities as well as K-12 schools and educational agencies. Our work is distinguished by its commitment to multiple literacies and perspectives, to sociocultural understanding, and to social justice.

**Department Mission**

Located in a major research university in an urban setting, the promise of our mission differs radically from similar programs in most departments or schools in colleges and state universities. While we, too, prepare professionals for all roles throughout the K-16 education system, our real impact comes through the research and scholarship that informs our doctoral and professional education programs and contributes to creative, thoughtful, and informed practice.

**LAI Faculty**

|  |  |
| --- | --- |
| **CISL PhD**  [**Richard Lamb**](https://ed.buffalo.edu/about/directory/faculty/profile.html?uid=dlbruce), Program Director  [Sam Abramovich](https://ed.buffalo.edu/about/directory/faculty/profile.html?uid=samuelab)  [Maureen Boyd](http://ed.buffalo.edu/teaching/directory/faculty/profile.html?uid=mpboyd)  [David Bruce](https://ed.buffalo.edu/about/directory/faculty/profile.html?uid=dlbruce)  [Claire Cameron](https://ed.buffalo.edu/about/directory/faculty/profile.html?uid=cecamero)  [Yunjeong Chang](http://ed.buffalo.edu/teaching/directory/faculty/profile.html?uid=ychang28)  [Elizabeth Etopio](http://ed.buffalo.edu/teaching/directory/faculty/profile.html?uid=etopio)  [Julie Gorlweski](http://ed.buffalo.edu/teaching/directory/faculty/profile.html?uid=jgorlews)  [Sameer Honwad](http://ed.buffalo.edu/teaching/directory/faculty/profile.html?uid=sameerho)  [Sunha Kim](http://ed.buffalo.edu/teaching/directory/faculty/profile.html?uid=sunhakim)  [Xiufeng Liu](http://ed.buffalo.edu/teaching/directory/faculty/profile.html?uid=xliu5)  [Mary McVee](https://ed.buffalo.edu/about/directory/faculty/profile.html?uid=mcvee)  [Deborah Moore-Russo](http://ed.buffalo.edu/teaching/directory/faculty/profile.html?uid=dam29)  [Ryan Rish](https://ed.buffalo.edu/about/directory/faculty/profile.html?uid=ryanrish)  [Sarah A. Robert](https://ed.buffalo.edu/about/directory/faculty/profile.html?uid=sarah)  [Maria Runfola](http://ed.buffalo.edu/teaching/directory/faculty/profile.html?uid=runfola)  [Alexandra Schindel](http://ed.buffalo.edu/teaching/directory/faculty/profile.html?uid=aedimick)  [Lynn Shanahan](http://ed.buffalo.edu/teaching/directory/faculty/profile.html?uid=ls34)  [Ji-Won Son](https://ed.buffalo.edu/about/directory/faculty/profile.html?uid=jiwonson)  [Noemi Waight](http://ed.buffalo.edu/teaching/directory/faculty/profile.html?uid=nwaight)  [X. Christine Wang](http://ed.buffalo.edu/teaching/directory/faculty/profile.html?uid=wangxc)  [Randy Yerrick](http://ed.buffalo.edu/teaching/directory/faculty/profile.html?uid=ryerrick) | **Literacy Ed**  [**Mary McVee**](https://ed.buffalo.edu/about/directory/faculty/profile.html?uid=mcvee)**,** Program Director  [Maureen Boyd](http://ed.buffalo.edu/teaching/directory/faculty/profile.html?uid=mpboyd)  [Ashlee Campbell](http://ed.buffalo.edu/about/directory/faculty/profile.html?uid=ashleeeb)  [Lynn Shanahan](https://ed.buffalo.edu/teaching/directory/faculty/profile.html?uid=ls34)  Jennifer Schiller  Brenna Towle  Tyler Rinker  Caroline Flury-Kashmanian |
| **College Teaching**  [**Julie Gorlewski**](https://ed.buffalo.edu/about/directory/faculty/profile.html?uid=jgorlews)**,** Program Director | **Math Ed**  [**Ji Won Son**](https://ed.buffalo.edu/about/directory/faculty/profile.html?uid=jiwonson)**,** Program Director  [Deborah Moore-Russo](http://ed.buffalo.edu/teaching/directory/faculty/profile.html?uid=dam29)  Jeri Dilletti  Amber Powell  Gerald Rising  Roger Wolbert  Patricia Doyle  Kristi Martin |
| **Teaching and Leading for Diversity**  [**Sarah A. Robert**](https://ed.buffalo.edu/about/directory/faculty/profile.html?uid=sarah)**,** Program Director  [Alexa Schindel](http://ed.buffalo.edu/teaching/directory/faculty/profile.html?uid=aedimick%E2%80%8B)  [Mary McVee](https://ed.buffalo.edu/about/directory/faculty/profile.html?uid=mcvee)  [Sameer Honwad](http://ed.buffalo.edu/teaching/directory/faculty/profile.html?uid=sameerho)  [Randy Yerrick](https://ed.buffalo.edu/about/directory/faculty/profile.html?uid=ryerrick)  [Sharon Raimondi](https://ed.buffalo.edu/about/directory/faculty/profile.html?uid=raimondi) | **Music Ed**  [**Maria Runfola**](https://ed.buffalo.edu/about/directory/faculty/profile.html?uid=runfola)**,** Program Director  [Elisabeth Etopio](http://ed.buffalo.edu/teaching/directory/faculty/profile.html?uid=etopio)  Terry Bacon, Adjunct  Gregory Chase, Adjunct  James Jordan, Adjunct  Richard Victor, Adjunct  Roberta Yee, Adjunct |
| **Early Childhood/Childhood**  [**Claire Cameron**](https://ed.buffalo.edu/about/directory/faculty/profile.html?uid=cecamero)**,** Program Director  Christine Wang, ECRC Director  Lilliam Malave  [Corinne Eggleston](http://ecrc.buffalo.edu/about/people-staff.php), ECRC Associate Director  [Keely Benson](http://ecrc.buffalo.edu/about/people-staff.php), ECRC Curriculum Coordinator  [Maureen Boyd](http://ed.buffalo.edu/teaching/directory/faculty/profile.html?uid=mpboyd)  [Ashlee Campbell](http://ed.buffalo.edu/about/directory/faculty/profile.html?uid=ashleeeb) | **Science Ed**  [**Noemi Waight**](https://ed.buffalo.edu/about/directory/faculty/profile.html?uid=nwaight)**,** Program Director  [Sameer Honwad](http://ed.buffalo.edu/teaching/directory/faculty/profile.html?uid=sameerho)  [Xiufeng Liu](https://ed.buffalo.edu/about/directory/faculty/profile.html?uid=xliu5)  [Alexa Schindel](http://ed.buffalo.edu/teaching/directory/faculty/profile.html?uid=aedimick%E2%80%8B)  [Randy Yerrick](https://ed.buffalo.edu/about/directory/faculty/profile.html?uid=ryerrick)  Michelle Eades-Baird  Bhawna Chowdhary  Melinda Whitford |
| **EdD, TPED**  **TBD,**  Program Director | **Science and the Public**  [**Julie Gorlewski**](https://ed.buffalo.edu/about/directory/faculty/profile.html?uid=jgorlews)**,** Program Director  Richard Lamb |
| **English Ed**  [**David Bruce**](https://ed.buffalo.edu/about/directory/faculty/profile.html?uid=dlbruce)**,** Program Director  [Julie Gorlewski](https://ed.buffalo.edu/about/directory/faculty/profile.html?uid=jgorlews)  [Ryan Rish](https://ed.buffalo.edu/about/directory/faculty/profile.html?uid=ryanrish)  Nichole Barrett  Paul Spitale  Charles Gonzalez  Sylvia Smyntek-Gworek | **Social Studies Ed**  [**Sarah A. Robert**](https://ed.buffalo.edu/about/directory/faculty/profile.html?uid=sarah)**,** Program Director  [Alexa Schindel](http://ed.buffalo.edu/teaching/directory/faculty/profile.html?uid=aedimick%E2%80%8B)  [Sameer Honwad](http://ed.buffalo.edu/teaching/directory/faculty/profile.html?uid=sameerho)  Anthony L. White, III  Keith Hughes  Rachael K. Short  Naomi Wiseman  Song Rio  Anne E. Martell  Adam D.J. Huck  Ebtssam Alqhtani |
| **Education Studies** (non cert)  [Ashlee Campbell](http://ed.buffalo.edu/about/directory/faculty/profile.html?uid=ashleeeb) | **Special Education PhD**  **Jointly Operated with Department of Exceptional Education, Buffalo State**  [**Sharon Raimondi**](https://ed.buffalo.edu/about/directory/faculty/profile.html?uid=raimondi)**,** Program Director  [Claire Cameron](https://ed.buffalo.edu/about/directory/faculty/profile.html?uid=cecamero)  [Shannon Budin](mailto:gormlese@buffalostate.edu), Buffalo State  [Gliset Colon](mailto:colong@buffalostate.edu),Buffalo State  Coordinator of Bilingual Education  [Lawrence Maheady](mailto:maheadlj@buffalostate.edu), Buffalo State  Endowed Chair in Special Education  [Lisa Rafferty](about:blank), Buffalo State  [Raquel Schmidt](mailto:schmidrj@buffalostate.edu), Buffalo State  Chair, Department of Exceptional Education  [Awilda Ramos-Zagarrigo,](mailto:ramosza@buffalostate.edu) Buffalo State  Director of TESOL |
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| **ESOL**  [**Lilliam Malave**](https://ed.buffalo.edu/about/directory/faculty/profile.html?uid=malave)**,** Program Director  [Janina Brutt-Griffler](http://ed.buffalo.edu/about/directory/faculty/profile.html?uid=bruttg), faculty  [Erin Kearney](https://ed.buffalo.edu/about/directory/faculty/profile.html?uid=ekearney), faculty  [Lynne Yang](http://ed.buffalo.edu/about/directory/faculty/profile.html?uid=lryang), faculty | **Undergraduate Minor**  [**Elisabeth Etopio**](https://ed.buffalo.edu/about/directory/faculty/profile.html?uid=etopio)**,** Program Director  [Sarah A. Robert](https://ed.buffalo.edu/about/directory/faculty/profile.html?uid=sarah) |
| [**Gifted Ed**](http://ed.buffalo.edu/teaching/academics/ac/gifted-ed.html)  [**Sharon Raimondi**](https://ed.buffalo.edu/about/directory/faculty/profile.html?uid=raimondi)**,** Program Director  [Ji-Won Son](https://ed.buffalo.edu/about/directory/faculty/profile.html?uid=jiwonson)  [Rosemary Callard-Szulgit](mailto:rc68@buffalo.edu), adjunct faculty  [Gayle Angert](mailto:gayleang@buffalo.edu) , adjunct faculty | **Bilingual,** Program Director  [**Lilliam Malave**](https://ed.buffalo.edu/about/directory/faculty/profile.html?uid=malave)**,** Program Director  [Janina Brutt-Griffler](http://ed.buffalo.edu/about/directory/faculty/profile.html?uid=bruttg), faculty  [Erin Kearney](https://ed.buffalo.edu/about/directory/faculty/profile.html?uid=ekearney), faculty  [Lynne Yang](http://ed.buffalo.edu/about/directory/faculty/profile.html?uid=lryang), faculty |
| **LOTE,** Program faculty  [**Lilliam Malave**](https://ed.buffalo.edu/about/directory/faculty/profile.html?uid=malave)**,** Program Director  [Janina Brutt-Griffler](http://ed.buffalo.edu/about/directory/faculty/profile.html?uid=bruttg), faculty  [Erin Kearney](https://ed.buffalo.edu/about/directory/faculty/profile.html?uid=ekearney), faculty  [Lynne Yang](http://ed.buffalo.edu/about/directory/faculty/profile.html?uid=lryang), faculty | **Foreign and Second Language Education, Ph.D.**  [**Lilliam Malave**](https://ed.buffalo.edu/about/directory/faculty/profile.html?uid=malave)**,** Program Director  [Janina Brutt-Griffler](http://ed.buffalo.edu/about/directory/faculty/profile.html?uid=bruttg), faculty  [Erin Kearney](https://ed.buffalo.edu/about/directory/faculty/profile.html?uid=ekearney), faculty |

**LAI Staff**

|  |  |
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| **Assistant to the Chair**  **Monica Washington**  [mcw22@buffalo.edu](mailto:mcw22@buffalo.edu) 716-645-1350 | **Assistant to the Chair**  **Lisa Monpere-Cruz**  [lmonpere@buffalo.edu](mailto:lmonpere@buffalo.edu) 716-645-4022 |
| **Assistant to the Chair**  **Liz Schaal**  [eamanuel@buffalo.edu](mailto:eamanuel@buffalo.edu) 716-645-4038 | **Department Secretary**  **Jen Conley**  [jjandrze@buffalo.edu](mailto:jjandrze@buffalo.edu)  716-645-4039 |
| **Associate Dean for Interprofessional Education and Engagement**  **Randy Yerrick**  [ryerrick@buffalo.edu](mailto:ryerrick@buffalo.edu) 716-645-2455 | **Associate Dean for Academic Affairs**  [**Maria Runfola**](https://ed.buffalo.edu/about/directory/faculty/profile.html?uid=runfola)  [runfola@buffalo.edu](mailto:runfola@buffalo.edu) 716-645-4033 |
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| **Director, Fisher-Price Early Childhood Research Center**  **Christine X. Wang**  [wangxc@buffalo.edu](mailto:wangxc@buffalo.edu) 716-645-4056 |  |

**Overview of Graduate Programs**

The Department of LAI offers a variety of disciplinary and interdisciplinary programs: Master of Education degrees leading to New York State (NYS) certification, Master of Education degrees that do not lead to certification and Advanced Certificates. Within the framework approved by department faculty and registered with the New York State Education Department (NYSED), graduate programs are designed to respond to current needs in education and to students' career goals and professional preparation. The programs consist of various learning opportunities: required course work; experiential learning; and research projects.

The LAI department faculty and student body works continuously to empower and support diverse voices and cultures to challenge outdated presumptions and set a new course for education that reflects our inclusive populous. Our immersive and engaging learning community welcomes into our academic community, faculty, staff, and students from globally represented cultural heritages and traditions.

All licensure programs offered by the Department of Learning and Instruction were accredited by the Teacher Education Accreditation Council (TEAC). Currently, we are pursuing accreditation through the Association for Advancing Quality in Educator Preparation (AAQEP).

#### **General Requirements for Admissions to Master's degree programs in LAI.**

Each applicant must submit an application to the Department of Learning and Instruction, which must include a letter stating the applicant's academic background detailing reasons their inclinations toward advanced study.

International applicants must fulfill the University's [English Proficiency Requirement](https://www.buffalo.edu/internationaladmissions/graduate-english-waiver.html) as described under the University’s International Admissions policy. [International student resources](https://ed.buffalo.edu/teaching/admission/international.html) for the LAI Department , along with some [frequently asked question](https://www.buffalo.edu/international-student-services/for-new-students/frequently-asked-questions.html) can be found using the links provided.

Applicants to the Initial certification or Initial/Professional certification (EdM), must have an undergraduate degree and have completed at least 30 credit hours in one of the following disciplinary areas: Biology, Chemistry, Earth Science, and Physics. The 30 credit hours must reflect content distribution for each of the specific disciplinary areas (see p. 13 for more information on the specific distribution). Note that some of these courses can be taken while enrolled in the specific program. Applicants may be accepted “on condition” and may complete these courses either prior to student teaching or prior to graduation.

Detailed information about the Science Education program can be found on page 11 of this handbook.

**Program and Degree Policies**

The department abides by the established student advisement, candidacy, continuous registration, readmission, degree conferral timetable, qualifying exams, thesis dissertation and placement policies. For details regarding these policies use this [link.](http://ed.buffalo.edu/current-students/elp-students/program-and-degree-policies.html)

## **Academic Standards Review**

In order to sustain academic standards and eligibility for continued enrollment, financial aid, and participation in university activities, the faculty of the department of Learning and Instruction regularly reviews academic records of all graduate students. Essentially, this review addresses the quality of students’ studies as measured by the student course grades.

Every student's academic progress is reviewed at the end of each semester.

### **Academic Good Standing**

A student is in good academic standing if the student’s cumulative UB graduate grade point average (GPA) is a 3.0 or greater.

### **Academic Warning**

Students receive an academic warning if their cumulative UB GPA is less than a 3.0

An academic warning is not be noted on the student’s official transcript, however it will be disclosed on the student’s departmental record.

### **Academic Probation**

When students are on academic probation, their UB GPA is less than 3.0 and they are considered to not be in good academic standing. A student is on academic probation, but not in academic good standing if his/her cumulative UB GPA is less than 3.0. Students can request to have UB summer or winter session grades evaluated as part of reconsideration of their probationary or dismissal status.

If a student is on academic probation (s)he cannot participate in university activities. In addition, students on academic probation will have to complete, with an academic advisor, a realistic academic strategy to complete further registration activity.

**Academic probation is not noted on a student’s official transcript, however it will be disclosed on the student’s record.**

### **Academic Dismissal**

Students at UB who have been enrolled for two or more semesters and have earned a cumulative UB GPA of less than 2.0 will be dismissed from their program and the university regardless of their most recent semester GPA.

All dismissed students will receive official notification via U.S. mail as well as through their UB email account. All further fall or spring semester registration access will be unavailable, however, dismissed students may register for or may keep their enrollment appointments for summer or winter sessions (e.g., students dismissed in December 2018 are able to enroll in winter 2019 courses).

Dismissed students may register as a non-degree students for enrollment in winter or summer sessions upon approval of their academic advisor. Students can apply for readmission one academic year after their dismissal (e.g., students dismissed after spring 2018 can apply for re-admittance for fall 2019).

Students may appeal their dismissal to the Dean of Graduate School of Education during a time specified in the dismissal letter. A consultation with an advisor is a requirement of the appeal process. If an appeal is granted, an outline of the terms and conditions of continued study will accompany the letter informing the student their appeal was successful.

Academic dismissal is noted on a student’s official transcript, and will be disclosed on the student’s record.

**The Role of the Academic Advisor**

Students are assigned an academic advisor once they have been admitted to the program. Students will consult with their academic advisors for guidance related to their program of study, course selection, and all other academic matters. Academic Advisors are also expected to review and sign documents related to application to candidacy.

**Science Education Faculty Members**

[Noemi Waight](https://ed.buffalo.edu/about/directory/faculty/profile.html?uid=nwaight)**,** Program Director

[Sameer Honwad](http://ed.buffalo.edu/teaching/directory/faculty/profile.html?uid=sameerho)

[Xiufeng Liu](https://ed.buffalo.edu/about/directory/faculty/profile.html?uid=xliu5)

[Alexa Schindel](http://ed.buffalo.edu/teaching/directory/faculty/profile.html?uid=aedimick%E2%80%8B)

[Randy Yerrick](https://ed.buffalo.edu/about/directory/faculty/profile.html?uid=ryerrick)

Michelle Eades-Baird

Bhawna Chowdhary

Melinda Whitford

**Department Student Organizations**

Use this link for information on Student Organizations within the Department of Learning and Instruction. [Graduate Student Association (LAI-GSA)](http://gsa.buffalo.edu/lai/)

**Alumni Association**

Use this [link](https://ed.buffalo.edu/alumni.html) for information on the GSE Alumni Association. While general gifts may be given to the school, it also is possible to restrict your donations to support specific programs or projects within GSE.

**Professional Associations**

[Association for Science Teacher Education](https://theaste.org/) (ASTE)

[National Association for Research in Science Teaching](https://www.narst.org/) (NARST)

[National Science Teachers Association](https://www.nsta.org/) (NSTA)

[Science Teachers Association of NY State](https://stanys.org/) (STANYS)

**Teacher Education Information**

The pathway to becoming a certified teacher in New York State requires the completion of specific mandates as outlined by the New York State Education Department. Our department helps guide and prepare students by providing extensive information regarding each certification requirement. Requirements include state-administered exams, workshops, and fingerprint clearance. Further information regarding the required exams, workshops, and fingerprinting is included in Appendix A.

The Teacher Education Institute (TEI) administers the clinical components for all initial and initial/professional certification programs. For further detail on expectations for field experience and student teaching, please refer to the [Guide to Field Experience and Student Teaching](http://ed.buffalo.edu/content/dam/ed/tei/docs/Field-Experience-Student-Teaching-Guide.pdf).

TEI also provides institutional recommendations for students who have completed a licensure program (i.e. initial, initial/professional, professional, Gifted, and Literacy). For further information on applying for your teacher certification please review the relevant links on the TEI certification page: <http://ed.buffalo.edu/tei/certification/apply.html>

For further information regarding teacher education certification requirements, please contact the Teacher Education Institute at (716) 645-2461 or [ubtei@buffalo.edu](mailto:ubtei@buffalo.edu)

**The Master’s (EdM) Degree**

**General Introduction and Information**

Our Master of Education degree and Initial Certification in Science Education are designed to be practice oriented and innovative programs for students who want to pursue a teaching career in Biology, Chemistry, Physics, or Earth Science for grades 7-12 with an option to add Grades 5-6 extension.

You will join a dynamic community of science teachers, educators, and researchers that engage with 21st century critical issues in Science Education. For example:

* What does it mean to teach science equitably for culturally and linguistically diverse students?
* How do we teach science for understanding?
* How do we promote and support lifelong learning and continuing professional development for pre and in-service science teachers?
* How do we promote engagement and critical thinking with critical issues among science teachers and students?

**Credit Hours & Master Coursework Requirements**

The Science Education Program offers initial certification only and/or initial certification and a Master of Education (EdM) or a Master of Education (EdM) in Biology, Chemistry, Earth Science, and Physics. Program requirements, academic credentials granted, certificate option, grade levels, credits required for completion, time to completion, career opportunities and experiential contact hours, and application deadline are listed for each program below:

[Biology Education](http://ed.buffalo.edu/teaching/academics/teacher-ed/biology.html) (Initial track)

[Biology Education](http://ed.buffalo.edu/teaching/academics/teacher-ed/biology.html) (Initial/Professional track)

[Biology Education](http://ed.buffalo.edu/teaching/academics/teacher-ed/biology.html) (Professional track)

[Chemistry Education](http://ed.buffalo.edu/teaching/academics/teacher-ed/chemistry.html) (Initial track)

[Chemistry Education](http://ed.buffalo.edu/teaching/academics/teacher-ed/chemistry.html) (Initial/Professional track)

[Chemistry Education](http://ed.buffalo.edu/teaching/academics/teacher-ed/chemistry.html) (Professional track)

[Earth Science Education](http://ed.buffalo.edu/teaching/academics/teacher-ed/earth-science.html) (Initial track)

[Earth Science Education](http://ed.buffalo.edu/teaching/academics/teacher-ed/earth-science.html) (Initial/Professional track)

[Earth Science Education](http://ed.buffalo.edu/teaching/academics/teacher-ed/earth-science.html) (Professional track)

[Physics Education](http://ed.buffalo.edu/teaching/academics/teacher-ed/physics.html) (Initial track)

[Physics Education](http://ed.buffalo.edu/teaching/academics/teacher-ed/physics.html) (Initial/Professional track)

[Physics Education](http://ed.buffalo.edu/teaching/academics/teacher-ed/physics.html) (Professional track)

Please see below information for Science Content Prerequisite for the Biology, Chemistry, Earth Science, and Physics certification track. A distribution of 30 credit hours in the following areas is required

|  |  |  |  |
| --- | --- | --- | --- |
| **Biology Certification Track** | **Chemistry Certification Track** | **Earth Science Certification Track** | **Physics Certification Track** |
| Ecology  Physiology/Developmental Biology  Molecular biology/Genetics  Biochemistry  Cell biology  Evolutionary biology | General chemistry  Inorganic chemistry  Organic chemistry  Analytical chemistry  Physical chemistry | Environmental science  Evolution of the earth and solar systems  Geological mapping  Geochemistry  Rocks and mineralogy  Surface processes and hydrology  Structure/Geophysics/Tectonics | General physics  Mechanics  Modern physics  Electricity and magnetism  Thermodynamics |

**Comprehensive Exam**

The Comprehensive Exam assesses major themes that relate to the Science Education Program. More specifically, the Comprehensive Exam addresses six sets of general or comprehensive questions that focus on science instruction planning, curriculum, instructional approaches, science assessment, science teaching and learning resources, and equity and inclusion. These questions are aligned with the Next Generation Science Standards and New York State Science Learning Standards.

This exam is administered once in the Spring and Fall.

**Academic Requirements**

See information for Academic Requirements under “Credit Hours & Master Course Work Requirements.”

**The Doctoral (PhD) Degree**

**General Information**

Students interested in doctoral study in science education should secure a PhD Curriculum, Instruction and the Science of Learning Handbook. More information can be found at this [link](http://ed.buffalo.edu/teaching/academics/doctorate/cisl.html).

**Credit Hours and & PhD Coursework Requirements**

The following is an example of a PhD degree program with a concentration in Science Education.

|  |  |  |
| --- | --- | --- |
| **Sample Curriculum for Science Education** | | |
|  | |  |
| **Subject Code & Number:** | **Course Title:** | **Credit Range:** |
| **Required Courses**: | | **52** |
| Concentration | | **24** |
| LAI 615 | Professional Seminar in CISL | 3 |
| Must take one of the following CISL core courses (or another approved by advisor): | | 3-21 |
| LAI 637 | \*Research in STEM Education | 3-12 |
| LAI 639 | History and Philosophy of Science for Science Teacher | 3 |
| LAI 634 | Leadership in K-16 Science Instruction | 3 |
| LAI 671 | Philosophy of Technology | 3 |
| LAI 685 | Design Based Research | 3 |
| LAI 603 | Curriculum Theory & Research | 3 |
| LAI 671 | The Philosophy of Technology | 3 |
| LAI 673 | New Literacies Seminar | 3 |
| LAI 678 | Digital Media in Education | 3 |
| In addition to at least one of the above, students must choose from courses and seminars in academic specialization, theories of curriculum, instruction and science of learning to meet the required 24 credit hours of content core. Students can choose from the following or another course approved by their advisor: | | 0-18 |
| LAI 687 | Narrative Research Methods | 3 |
| LAI 621 | Critical Interpretations of Research | 3 |
| LAI 633 | Vygotsky’s Educational Theory Culture | 3 |
| LAI 588 | Intersectionality & Education | 3 |
| LAI 631 | Doctoral Seminar: Special Ed: Curriculum and Instruction | 3 |
| LAI 649 | Learning Theories | 3 |
| LAI 695 | Dept. Practicum in University Teaching | 3 |
| Research Core | | **28** |
| LAI 697 | Research Analysis in CISL (Exam) | 1 |
| LAI 645LAB | Research Practicum in CISL (Research Component) | 6 |
| LAI 625 | Discourse Analysis | 3 |
| LAI 626 | Advanced Qualitative Research Field Methods | 3 |
| LAI 669 | Qualitative Techniques for Education | 3 |
| LAI 657 | Analysis of Quantitative Research I | 4 |
| LAI 658 | Analysis of Quantitative Research II | 4 |
| Students can also take the following Master’s Level courses to meet Content Concentration. Note that there are limitations to the number of credits that can be applied to the PhD program. Please consult with your advisor to ensure approval of these courses. | |  |
| LAI 531 | Science Curricula: Current Approaches | 3 |
| LAI 532 | Technology and Science Teaching | 3 |
| LAI 533 | Seminar in Science Instruction | 3 |
| LAI 534 | Seminar in Environmental Education | 3 |
| LAI 575 | Seminar in Informal Science Education | 3 |
| LAI 674 | Technology as Social Practice | 3 |
| Master's credits |  | 10 |
| **Culminating Experience: Dissertation** | | **Min 10** |
| LAI 702 | Dissertation Guidance | 10 |
| **Total Credit Hours:** |  | **72-74** |

\*LAI 637 is a special topics course that addresses special topics in four domains: Equity, Inclusion and Social Justice; Educational Technology; Assessment; and Curriculum. These special topics are offered on a rotation basis. You can enroll in this course for a maximum of 12 credits provided it addresses the different domains listed above.

**For additional information regarding the PhD degree including graduation requirements see the CISL Handbook.**

**International Students Information**

Questions and concerns related to International Student Services can be obtained through the International Student Services Office. The link for this resource is <http://www.buffalo.edu/international-student-services.html>

**Online Education**

Some courses within this program can be taken online. However, note that face-to-face courses are the norm in this program.

# **Degree Conferral**

**Candidacy**

Apply for Graduation via the HUB Student Center:

Notify the University of your expected Conferral (graduation) date via the HUB Student Center. The “apply for graduation” link is on the “My Academics” tab.

Note: Should you miss the deadline, you will need to apply for the next conferral (graduation) date.

# UB confers degrees three times a year:

## **Application Deadlines**

|  |  |  |
| --- | --- | --- |
| Graduation Term | Application Deadline | Conferral Date |
| Fall | October 15 | February 1 |
| Spring | February 22 | June 1 |
| Summer | July 15 | September 1 |

Use this [link](https://registrar.buffalo.edu/degrees/degreeconferral.php) for more information about degree conferral.

Commencement information can be found at this [link](https://www.buffalo.edu/commencement.html).

**Details regarding various tasks that relate to graduation can be found at the following link:**

* [Apply for Graduation: A Must Do, and Degree Checkout Status](https://registrar.buffalo.edu/degrees/degrees/index.php#apply)
* [Double Degree Candidates (i.e. BS and BA, two degrees awarded at one time)](https://registrar.buffalo.edu/degrees/degrees/index.php#double)
* [Follow Up With Advisement](https://registrar.buffalo.edu/degrees/degrees/index.php#advisement)
* [Review Your Transcript(s)](https://registrar.buffalo.edu/degrees/degrees/index.php#transcript)
* [Confirm Your Grades](https://registrar.buffalo.edu/degrees/degrees/index.php#grades)
* [Pay Outstanding Bills](https://registrar.buffalo.edu/degrees/degrees/index.php#bills)
* [Verify Your Name and Address](https://registrar.buffalo.edu/degrees/degrees/index.php#verify)
* [Sign Up For Your Commencement Ceremony](https://registrar.buffalo.edu/degrees/degrees/index.php#ceremony)
* [Check-in with Career Services & Take the Undergraduate Senior Exit Survey](https://registrar.buffalo.edu/degrees/degrees/index.php#career-services)

**Campus Resources and Services**

**a. Student Advisement**

Upon acceptance into a program, you will be assigned an adviser who will develop a tentative plan of study based on your career goals, experiences and needs. A student has the right to change advisers for any number of reasons including interest in another faculty member’s research

**b. Office locations**

The LAI Main Office is on the 5th Floor of Baldy Hall; the Teacher Education Institute is on the 3rd floor of Baldy Hall in room 375.

**c. UB Libraries**

There are multiple libraries available on campus for a complete listing please see the following link: <https://library.buffalo.edu/>.

However, two libraries will be of interest to music education students: The graduate library known as [Lockwood Memorial Library](https://library.buffalo.edu/lml/) and the [Music Library](https://library.buffalo.edu/music/) in Baird Hall.

**d. UB Information Technology**

UB offers students a wide range of IT services. Complete information, including free software available to UB students, is found at the following link: <http://www.buffalo.edu/ubit.html>.

**e. UB Student Services**

For information regarding available student services, use the following link: [**https://1capen.buffalo.edu/**](https://1capen.buffalo.edu/).

**University Policy and Procedures**

**For a complete list of University Policies and Procedures please see the following websites:**

**Student Code of Conduct:** <http://www.buffalo.edu/content/dam/www/studentlife/units/uls/student-conduct/ub-student-code-of-conduct.pdf>

**Information Technology Polices:**

<https://catalog.buffalo.edu/policies/information_technology%20policies.html>

**Academic Integrity:**

<https://catalog.buffalo.edu/policies/integrity.html>

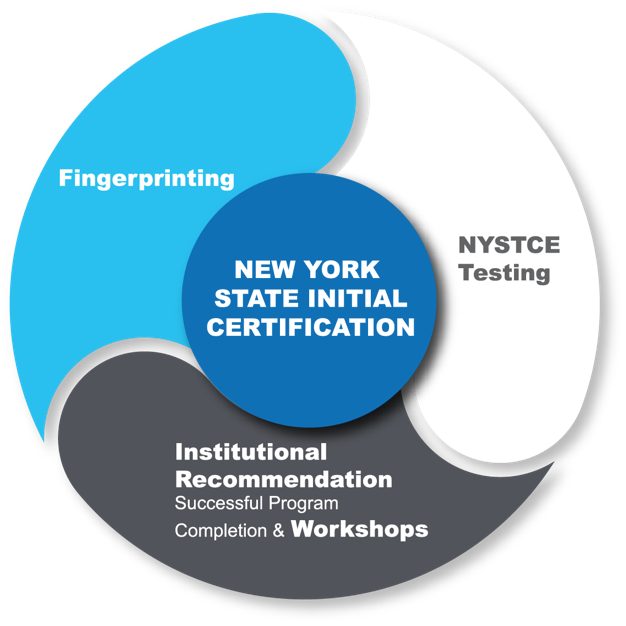
All policy and procedures for graduate study at UB can be found in the [Graduate School Policy Library](https://grad.buffalo.edu/succeed/current-students/policy-library.university-policies.html). By using this link you will be sure to find the most up to date information.

The LAI Department reserves the right to amend, alter, and update the policies, procedures, or other information provided in this handbook as needed. Changes, revisions, and amendments to the material in this handbook will be published on the LAI Department website and in future editions of the handbook.

**Appendix A**

**Requirements for Initial Teacher Certification**

There are numerous pathways to becoming a certified teacher in New York State. As a student in this program, you will be eligible to receive initial certification through an Approved Teacher Preparation Program. In addition to program completion, there are several requirements that you should be aware of, and for which you should assume responsibility.

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**Fingerprinting**

All fingerprinting required by the Education Department for certification or employment in schools must be scheduled with MorphoTrust. Information is available at:<http://www.highered.nysed.gov/tsei/ospra>

Students must complete fingerprinting prior to enrollment in school - based clinical experiences (i.e. LAI 667: Field Experience).

**Workshops**

All applicants for initial teacher certification in New York State must complete the following workshops. Proof of workshop completion is required to be submitted to TEI as a part of LAI 667: Field Experience.

**·**  [**Dignity for All Students Act (DASA)**](http://www.highered.nysed.gov/tcert/certificate/dasa-applicant.html): The DASA workshop is composed of six hours of coursework and training in harassment, bullying and discrimination prevention and intervention. Training is available through the Alberti Center at UB. Applicants can register for the workshop at http://gse.buffalo.edu/alberticenter/dignity. Information about additional NYSED-approved providers can be found at http://www.highered.nysed.gov/tcert/certificate/dasa-applicant.html.

**·**  [**Mandated Reporter for Child Abuse and Neglect**](http://www.nysmandatedreporter.org/TrainingCourses.aspx): All applicants for certification are required to complete two hours of training regarding the identification and reporting of suspected child abuse and maltreatment. More information and a list of providers can be found at [http://www.highered.nysed.gov/tcert/certificate/ca.html](http://www.highered.nysed.gov/tcert/certificate/ca.html%20).

**·**  [**Schools Against Violence in Education (SAVE)**](http://www.violenceworkshop.com/): All applicants for certification must complete two hours of training in school violence prevention and intervention. Information and a list of providers can be found at [http://www.highered.nysed.gov/tcert/certificate/save.html](http://www.highered.nysed.gov/tcert/certificate/save.html%20).

**New York State Teacher Certification Exams (NYSTCE)**

In order to be issued a New York State initial teacher certificate, the New York State Education Department (NYSED) requires certificate applicants to take and pass a set of [NYSTCE](http://www.nystce.nesinc.com/).

**·**  [**Educating All Students Test (EAS)**](http://www.nystce.nesinc.com/TestView.aspx?f=HTML_FRAG/NY201_TestPage.html): The EAS consists of selected-response items and constructed-response items. Each constructed-response item will share scenario-based stimulus material with several selected-response items. This exam aims to assess the professional and pedagogical knowledge and skills necessary to teach all students effectively in New York State public schools.

**·**  [**Content Specialty Test (CST)**](http://www.nystce.nesinc.com/PageView.aspx?f=GEN_Tests.html): The CST is certification area-specific and aims to assess your content knowledge and pedagogical content knowledge.

NYSED is in the process of revising the CST’s. All new exams are now operational with the exception of the sciences (Biology, Chemistry, Earth Science and Physics), which will be operational in the Fall of 2018, and the Fine Arts (Dance, Music, Theater and Visual Arts), date still to be determined.

Those who wish to be certified in both Early Childhood and Childhood Education must take and pass a total of 5 sections of the Multi-Subject Exams for Early Childhood and Childhood. The Multi-Subject Tests contains three parts. Applicants must complete Sections 1 and 2 of both exams and Section 3 of just one of the exams.

* + - Part One: Literacy and English Language Arts - Early Childhood
    - Part One: Literacy and English Language Arts - Childhood
    - Part Two: Mathematics - Early Childhood
    - Part Two: Mathematics - Childhood
    - Part Three: Arts and Sciences - Early Childhood OR Childhood

Candidates must successfully pass all parts of the Multi-Subject Test in order to be certified. Candidates may register to take all parts at the same time (which may be less expensive) or may register to take each part separately.

* + Bilingual Education Assessment (BEA)
    - Only applicable to those seeking the bilingual extension
    - The BEA aims to assess knowledge of foundations of bilingual education as well as language comprehension and expression.

* [**Educative Teacher Performance Assessment (edTPA)**](http://www.highered.nysed.gov/tcert/certificate/certexamedtpa.html): The edTPA is completed concurrently with student teaching and aims to assess knowledge and skills related to planning, instruction and assessment through extensive written commentary and sample video recording of your practice.

In April 2014, the Board of Regents adopted a “safety net” that provides an option for those who many not pass the edTPA on their first attempt (<http://www.highered.nysed.gov/tcert/certificate/certexamsedtpa.html>); however, our goal is for all students to pass the edTPA. More information will be provided as part of the Field Experience course, LAI 667, and the Seminar in Teaching course, LAI 674.

For edTPA safety net measures, please visit:<http://www.highered.nysed.gov/tcert/certificate/certexamsedtpa.html>

**Institutional Recommendation**

Upon successful completion of the certification program, applicants are eligible to be considered for a UB recommendation for an initial teacher certificate. This recommendation verifies that the candidate has completed a New York State registered program and provides evidence that they have completed the required workshops. Applications for recommendations can be found at

<http://ed.buffalo.edu/tei/certification>.

Candidates seeking initial certification OR initial / professional certification will complete the Initial Teacher Certificate application, provide an official transcript, as well as documentation of completion of the three required workshops.