

VSBPE

Date: Aug. 13, 2019

Item: Champlain College New Program Application

ITEM: Shall the VSBPE accept Champlain College's application for a ROPA review of its proposed new secondary and middle grades math program?

AGENCY RECOMMENDED ACTION:

That the VSBPE accepts Champlain College's application for a ROPA review of its proposed new secondary and middle grades math program.

BACKGROUND:

Champlain submitted its application to the ROPA Consultant on June 28, 2019.

RATIONALE:

The application is complete and thorough.

SUPPORTING DOCUMENT: Champlain's application



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TO: Vermont Agency of Education and Vermont Standards Board for Professional Standards
FROM: Laurie Quinn, Ph.D. Provost and Senior Vice President for Academics
DATE: June 27, 2019
RE: Site Visit for New Mathematics Middle and Secondary Endorsements

To whom it may concern:

This letter is to formally request a site visit for a new program review at Champlain College.

Enclosed you will find a completed application for a new endorsement for Middle Level Mathematics (grades 5-9) and Secondary Education Mathematics (grades 7-12).

Sincerely,

Laurie Quinn, Ph.D.
Provost and Senior Vice President for Academics

Application for New Program Review

Directions: Applicants seeking a new program review must submit the following to the AOE:

1. A completed application
2. [A formal letter requesting a review visit from the president](#) or head of the institution
3. **New Program Application fee of \$2000 to the Vermont Agency of Education.**

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| Program Name | Champlain College |
| Address | 163 South Willard Street, Burlington, VT 05401 |
| Contact Name | Kathryn Leo-Nyquist, Program Director, Teacher Education |
| Phone | 802-651-5859 |
| Email | leo@champlain.edu |

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| Endorsement Area(s) Sought | Middle Grades Math (sub-endorsement); Secondary Math |
| Rationale | <p>Champlain College education students continue to seek a mathematics endorsement. In the last two years, three students have achieved the mathematics minor and have attempted the transcript review process. At this point all we can offer is advising and course selection that offers students a chance to achieve a Mathematics endorsement through “transcript review” which is the process of qualifying for additional endorsements by documentation of qualifications via academic transcripts. This is an inefficient and uncertain process for students.</p> <p>Mathematics education is an area of need in the workforce. There continues to be need in the field for teachers who are licensed to teach Mathematics. The Vermont Agency of Education has designated Mathematics as teacher shortage areas during the 2018-2019 school year, and the Department of Education lists Mathematics as a teacher shortage area in other states across the country.</p> <p>Champlain already offers a robust Mathematics minor and will now offer an applied major in Mathematics. Secondary and Middle Level Education courses currently offered are flexible enough to incorporate mathematics content and methodology. We expect limited institutional costs to develop this program.</p> |
| Program Delivery Model | Traditional, Undergraduate |
| Timeline | Start Fall 2020 |
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| <p>Existing Approved Programs and Delivery Models</p> | <p>Champlain College is approved by the Vermont Standards Board for Professional Educators to recommend a person who satisfactorily completes the approved program as eligible for licensure and/or endorsement the following areas: Early Childhood Education (PK through grade 3/age 3 – age 8), Early Childhood Education with Infant/Toddler Endorsement (Birth through grade 3), Elementary Education (Grades K-6), English (Grades 7-12), Middle Grades: English (Grades 5-9), Middle Grades: Social Studies (Grades 5-9), and Social Studies (Grades 7-12).</p> <p>Please see our Institutional Portfolio from ROPA Self-Study, 2017 for more details about our Education Program and our Seven Year Plan for goals and action steps toward concerns and considerations from our review.</p> |
| <p>Programs under Conditional Approval</p> | <p>NONE</p> |
| <p>Progress toward Addressing Identified Program Concerns From 2017 ROPA Self-study and Site Visit</p> | <p>Concern #1: Based on observations and the EDU 160 syllabus, The PK-3 math/science course needs more explicit instruction in math practices and content.</p> <p>Actions to Address Concern #1: EDU 160 Syllabus was revised to reflect a balance of PK-3 math and science content (Fall 2018). Worked with faculty in EDU 311 (Elementary Science Methods) and EDU 312 (Elementary Math Methods) to ensure intentional review of early education math AND science content AND methods. Collaborated with our Math Program (now a major at Champlain) to develop a dedicated Foundations of Math for Education majors while considering Common Core State Standards, NCTM standards and Vermont Licensure Math Endorsement standards. See EDU 160 Spring 2019 Syllabus.</p> <p>Concern #2: Elementary Education Praxis II scores in Social Studies indicate a need to review social studies methods content, to address all four core disciplines of the social studies: Civics, Economics, History, and Geography.</p> <p>Actions to Address Concern #2: Began review of Social Studies Praxis Specific Content with NCSS C3 standards specifically in EDU 313 (Elementary Social Studies Methods). Integrated Social Studies Praxis Specific Content and Methods into EDU 255 (Primary Integrated Curriculum) syllabus and course content. Began mapping Social Studies</p> |

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| | <p>content across all elementary education courses and CORE (general education) curriculum to review gaps in the four core disciplines of social studies (Civics, Economics, History, and Geography). See linked score report on Praxis 0004 Elem Ed: MS Social Studies Tests since last ROPA Self-study and Site Visit (4/17-5/19).</p> |
| <p>Potential Impact of Proposed Program on Existing Programs</p> | <p>As personal learning plans and advisories take a more prominent role, our current middle and secondary education students would benefit by learning more about the interdisciplinary possibilities of mathematics by learning with future Mathematics teachers . Moreover, the kinds of exposure and cross-curricular experiences that new Mathematics candidates would offer will further develop Champlain Education Program Outcomes such as Standard #5: Application of Content and Standard #7: Planning for Instruction. These standards directly ask candidates in all endorsement areas to integrate cross-disciplinary skills.</p> <p>These new endorsements will lead to robust connections between Mathematics faculty in the Division of Information Technology and Sciences and Education faculty in the Division of Education and Human Studies at Champlain College.</p> |

Please provide a brief overview of the proposed program(s). Attach a curriculum map detailing the program’s alignment with the *Core Teaching and Leadership Standards* and endorsement knowledge and performance standards and additional documentation, as needed.

We propose a third endorsement area for Middle Level majors (grades 5-9) and a Secondary Education Mathematics major (grades 7-12).

For Detailed Program Alignment with the *Core Teaching and Leadership Standards*, please follow link to this document labeled, [Champlain College’s Assessment of the Core Teaching Standards](#)

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| <p>Describe criteria for admission</p> | <p>Admission Criteria</p> <p>All Champlain College students are directly admitted into specific programs (endorsement areas) at the time of acceptance and admission to the College. Once admitted, each student is assigned a Program Faculty Advisor, an Academic Specialist and a Career Advisor.</p> <p>Continuance: A second year review is conducted to ensure students have met the following:</p> <ul style="list-style-type: none"> ■ Maintaining a Minimum GPA of 3.0 both overall and in the major ■ Achieve a Minimum of C- in all Education Major courses to obtain credit for licensure program ■ Passed CORE PRAXIS or equivalent ■ Review Education Program Professional Attributes and Dispositions |
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| <p>Curriculum Overview (course titles and descriptions)</p> | <p><i>Math Foundation Courses</i></p> <ul style="list-style-type: none"> ● MTH-230 (Calculus I) This course teaches the common application of calculus theories. You will investigate basic topics of differential and integral calculus with a specific emphasis on applications. You will perform differentiation and integration of algebraic and transcendental functions, apply optimization techniques, and learn to formulate and solve differential equations. ● MTH 240 (Calculus II) This is the second course in single-variable calculus. Students will learn techniques and applications of integration, be given further exposure to trigonometric, logarithmic, and exponential functions, and learn the basics of infinite sequences and series. ● MTH-270 (Discrete Mathematics) Students will learn the concepts, techniques, and structures of discrete mathematics necessary for the software engineer, including logic, sets, functions, relations, Boolean algebra, and combinatorics. The course also introduces the concept of mathematical proof. ● MTH-285 (Probability and Statistics) This course provides an introduction to probability and statistics with applications. Topics include: basic combinatorics, random variables, probability distributions, Bayesian inference, hypothesis testing, confidence intervals, and linear regression. ● MTH-310 (Linear Algebra) This is an introductory course in linear algebra. Topics include systems of linear equations, matrix algebra, determinants eigenvalues & eigenvectors and an introduction into the theory of vector spaces. ● MTH-340 (Vector Calculus) This course is designed to develop the topics of multivariate calculus. Emphasis is placed on multivariate functions, partial derivatives, multiple integration, solid analytical geometry, vector valued functions, and line and surface integrals. Upon completion, students should be able to select and use appropriate models and techniques for finding the solution to multivariate-related problems. ● CSI-140 (Introduction to Programming) Students will learn the history and basis of computing as well as the fundamentals of programming. Topics include: the history of computing, binary and hexadecimal number systems and mathematics, Boolean logic, algorithm design and implementation and modern computer organization. Programming topics include: memory and variables, mathematical operations, basic file I/O, decision making, repetitions and subroutine. ● CSI-160 (Python Programming) Students will learn the history and basics of computing as well as the fundamentals of Python programming. General topics include: the history of computing, number systems, Boolean logic, algorithm design and |

implementation, and modern computer organization. Programming topics include: memory and variables, data types, mathematical operations, basic file I/O, decision-making, repetitions, functions, and list basics.

List of Math Electives

- MTH-115 (Foundations of Mathematics) This course is intended for students not specializing in quantitative-based programs of study. Foundations of Mathematics is a survey of contemporary topics in mathematics with an emphasis on application. Topics presented include set notation, number theory, probability and descriptive statistics, logic, algebra, plane geometry, and consumer mathematics. Coverage centers on an assortment of real-world examples and applications, demonstrating the usefulness relevance, and attractiveness of mathematics.
- MTH-180 (Introduction to Statistics) Teaches a statistical approach to decision making under uncertainty. Topics are descriptive statistics, probability distributions, inferential statistics, confidence intervals, hypothesis testing, linear regression and correlation.
- MTH-250 (Matrices, Vectors, and 3D Math) Matrices, Vectors, and 3D Math introduces students to applied Linear Algebra, including systems of linear equations, matrix and vector operations change of basis, and transformations. Additionally, it presents a variety of topics from 3D mathematics including vector mathematics lines and planes, vector-valued functions, velocity acceleration, and surfaces. Students will write computer programs and use mathematical software to explore all aspects of the topic.
- MTH-275 (Cryptography) Students explore the mathematical foundation attacks, and historical significance of various ciphers. Mathematical topics include modular arithmetic, elementary number theory, elementary combinatorics, and Boolean algebra. Cryptographic topics include shift ciphers, substitution ciphers, block ciphers, Hill Cipher, Vigenere Cipher, the Enigma machine, RSA, DES/3DES Rijndael Cipher/AES, and TLS/SSL. The emphasis will be on understanding the underlying mathematics, so previous programming experience is not necessary.
- MTH-280 (Applied Statistics) Teaches the practical side of exploring presenting, and analyzing data. Students will learn to effectively use a statistical software package to accomplish these tasks. After learning to graphically display data in meaningful ways students will learn to analyze data, test claims and make valid conclusions. These analyses will include hypothesis tests involving more than one sample, linear and multiple linear regressions chi-squared tests of independence and goodness of fit, and ANOVA.

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| | <ul style="list-style-type: none"> ● MTH-350 (Numerical Methods) This is a course in numerical analysis which focuses more on the methods and less on convergence and error analysis. Topics include Taylor series, numerical root finding interpolation, numerical differentiation and integration, approximate solutions to differential equations, and solving systems of equations. ● MTH-215 (History of Mathematics) Survey of the development of mathematics from antiquity to the present, with an emphasis on the achievements, problems, and mathematical viewpoints of each historical period and the evolution of basic concepts such as number, geometry, construction, and proof. ● MTH-315 (Survey of Geometries) Survey the foundations of Euclidean geometry including an introduction to non-Euclidean geometry. Topics include geometric constructions, congruence, similarity, transformations, measurement, and coordinate geometry. Axiomatic systems and proofs are covered. ● MTH-380 (Regression Analysis) This course focuses on the understanding and presentation of regression models and associated methods, data analysis, interpretation of results, statistical computation and model building. |
| <p>Endorsement Overview</p> | <p>At the following links, please find curriculum maps for middle level and secondary mathematics endorsements. These maps were created in collaboration with Champlain College Mathematics Department Faculty.</p> <p>Champlain College Middle Level Mathematics Endorsement Map</p> <p>Champlain College Secondary Mathematics Endorsement Map</p> |
| <p>Desired impact of program</p> | <p>We believe this will increase enrollment in both our middle and secondary level majors. Because Champlain already offers a robust minor and will offer a major in Mathematics and Secondary Education courses are flexible enough to incorporate mathematics applications, we foresee no new courses at this time. Thus, we expect that the costs for developing this program will be low. Given these low barriers, these new math-focused programs in Education and the new Applied Mathematics major will be opening Champlain to new groups of potential students.</p> <p>The Mathematics Department at Champlain College has made clear in their curriculum planning for approved new Mathematics courses as well as for the Applied Mathematics program in general that incorporating future Education majors was a key goal. For that program to achieve its potential, Mathematics faculty want to work with Education faculty to connect with high school Mathematics teachers to stay connected to numeric literacy in K-12. Moreover, Mathematics faculty have made clear</p> |

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| | <p>that this long term partnership with Education faculty will enhance their curricular offerings as well as programmatic choices.</p> |
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| <p>Assessment System Overview</p> | |
| <p>Key Assessments</p> | <p>Please see Education Program Assessment evidence from Standard Two of Champlain College Institutional Portfolio from the 2017 ROPA Self Study.</p> <p>Candidates in all majors complete pedagogical coursework in the education program where they are assessed on a variety of assignments related to their pedagogical knowledge. These include lesson plans and unit plans. Follow link to Champlain College’s Assessment of the Core Teaching Standards.</p> <p>Assessment of candidates’ proficiency with the ten Vermont Core Teaching Standards is further analyzed as one of the three pieces of evidence for the PALS report vis a vis Vermont Licensure Portfolio, both quantitatively and qualitatively (we gather teacher feedback on the forms to consider programmatic changes). Champlain College participates in the Educator Preparation Inquiry Collaborative (EPIC)’s professional learning sessions, yearly conference and calibration sessions.</p> <p><i>Student Teaching & Practicums:</i></p> <p>Mid-Semester Feedback Form</p> <p>Student Teaching Final Feedback & Evaluation Form</p> <p>Middle School/Secondary Teacher Education pedagogical coursework:</p> <ul style="list-style-type: none"> ■ Integrating Technology, EDU 112 ■ Content Literacy, EDU 230 ■ Curriculum Design & Differentiated Instruction, EDU 335 ■ Secondary Teaching Methods, EDU 332 ■ Integrated Curriculum/Student Teaching, EDU 490 <p>Middle School Only:</p> <ul style="list-style-type: none"> ■ Middle School Organization, EDU 315 |

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| | <p>Mathematics Syllabi:</p> <ul style="list-style-type: none"> ● Calculus II, MTH 240 ● Discrete Mathematics, MTH 270 ● Linear Algebra, MTH 310 ● Vector Calculus, MTH 340 |
| Essential Data to be collected | <p>Content area and pedagogy (methods) course assessments are aligned with Endorsement areas Champlain College Middle Level Mathematics Endorsement Map AND Champlain College Secondary Mathematics Endorsement Map and Core Teaching Standards. Praxis II scores in Math and/or Middle Grades Math.</p> |
| Proposed Evaluation System | <p>Our Program Assessment Learning System (PALS) assesses across the Ten Core teaching standards vis a vis the Vermont Licensure Portfolio and Cooperating Teacher Evaluations. In addition The Core Teaching Standards will be assessed over the four years of the program vis a vis signature assignments across a four year performance portfolio. Course learning outcomes that align with specific Knowledge and Performance Standards for the Endorsement areas as well as Praxis II content scores (Middle Grades Math and Secondary Math will be assessed and analyzed for proficiency.</p> |
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Additional resource links:

[ROPA Institutional Portfolio 2017](#)
[Champlain College Education Program 7-Year Plan](#) Revised 5/14/19 for
Champlain College Education Program [2019 Annual Report](#)