

BOR ACADEMIC AND STUDENT AFFAIRS COMMITTEE AGENDA Friday September 6, 2019 at 9:30 a.m. <u>Western CT State University Midtown Campus</u> White Hall, Room 127 181 White Street

Danbury, CT 06810

- 1. Approval of Minutes
 - a. June 7, 2019 *Page 1*
- 2. Consent Items
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3. <u>Action Items</u>

- a. Modifications
 - i. Data Mining MS CCSU [Program Name Change and Modification/Substitution of Courses] – Page 18
 - ii. Data Mining Official Certificate (OCP) CCSU [Program Name Change and Modification /Substitution of Courses] *Page 29*
 - iii. Business Administration Online MBA Southern CT State University [Change from jointly conferred, with Liverpool John Moores University, to singly conferred] *Page 40*
 - iv. Coastal Resilience MS Southern CT State University [Change from jointly conferred, with Liverpool John Moores University, to singly conferred] *Page 48*
- b. New Programs
 - i. Technology Studies: Data Science Option AS Northwestern CT CC Page 61
- c. Suspensions
 - i. Energy Management AAS Tunxis CC- Page 76
- d. Renaming Institution's Academic Units from Schools to Colleges Southern CT State University *Page 80*
 - i. Renaming the School of Arts and Sciences as the College of Arts and Sciences
 - ii. Renaming the School of Education as the College Education
 - iii. Renaming the School of Health and Human Services as the College of Health and Human Services
- 4. Informational Items
 - a. Below Threshold
 - i. Principles of Manufacturing Certificate Naugatuck Valley CC Page 83



CT BOARD OF REGENTS FOR HIGHER EDUCATION

ACADEMIC & STUDENT AFFAIRS COMMITTEE

Meeting – June 7, 2019 - 9:30 a.m. 61 Woodland Street, Hartford

MINUTES

Regents Present:	Merle Harris, Naomi Cohen, Peter Rosa, Del Cummings
Regents Absent:	Aviva Budd, William Lugo
Staff Present:	Jane Gates, Alison Buckley, Bill Gammell, Ken Klucznik, Amanda MacTaggart, Steve McDowell, Linda Perfetto, Arthur Poole, Mike Stefanowicz, Pat Ryiz
Other Attendees:	Shirley Adams (COSC), Missy Alexander (WCSU), Robin Avant (I Dawn Bunting (CCC), Tuesday Cooper (MCC), Nicole Esposito (M

Other Attendees:Shirley Adams (COSC), Missy Alexander (WCSU), Robin Avant (HCC),
Dawn Bunting (CCC), Tuesday Cooper (MCC), Nicole Esposito (MCC),
David Ferreira (NCCC), Teresa Foley (ACC), Carol Gabriele (NVCC), C.
Connie Hotchkiss (NCCC), Miah LaPierre-Dreger (CCC), John Lewis
(QVCC), Steve Minkler (MxCC), Edith Ouellet (TRCC), Michael Rooke
(NCCC), William Salka (ECSU), Sheila Solernou (GCC), Michele Swan
(ACC), Crystal Wiggins (NCCC), Heidi Zenie (TRCC/SO)

The meeting was called to order at 9:32 a.m. by Chair Merle Harris.

- 1. Approval of Minutes
 - a. April 26, 2019

On a motion by P. Rosa and seconded by N. Cohen, a vote was taken and the minutes from the April 26, 2019 meeting were approved.

2. Action Items

a. Accreditation of a Licensed Program

i. <u>CSCU Retroactive Accreditation of Academic Programs</u>

Chair Harris stated that the Committee will act on programs-from which students have graduated-that have been identified as licensed but not accredited. Chair Harris read from the source document: Academic Programs Requiring Retroactive Accreditation by the Board of Regents (Attachment A). The programs fall into one of the following four categories:

- a) <u>List 1 Programs that have been terminated, consolidated or suspended</u> These programs will be accredited retroactively.
- b) List 2 Programs that have been submitted for action with inadequate data and very low enrollment which has not improved over the past three years – The Committee will approve accreditation for these programs, but requires that the institutions apply for continued accreditation in Fall 2019, after the census date. Chair Harris noted that the Middlesex CC Health Information Management AS Degree and Certificate will be removed from this list as both programs are already accredited.
- c) <u>List 3 Programs that have enrollment increases but which have not met</u> <u>projections</u> – The Committee will approve these programs for accreditation and will require institutions to apply for continued accreditation in Spring 2020, after the census date.
- d) <u>List 4 Programs deemed "healthy" which have met/exceeded their enrollment</u> projections and are financially profitable – The Committee will grant accreditation for these programs. Institutions will apply for continued accreditation after seven semesters.

Chair Harris noted that this accreditation action is state accreditation. Under the new BOR Academic Programming and Approval Policy, new programs will be licensed and accredited at the same time. Institutions will apply for continued accreditation after seven semesters. Some academic programs also receive accreditation from the appropriate professional organizations.

On a motion by N. Cohen, seconded by P. Rosa, to grant retroactive accreditation and continuing accreditation in accordance with Attachment A, a vote was taken and it was unanimous.

b. Suspensions

i. <u>Secondary Education: Earth and Planetary Sciences Option – BS – Western CSU</u> Provost Missy Alexander presented the Secondary Education: Earth and Planetary Sciences BS Option for WCSU which is planning to suspend the program due to low enrollment and after will determine continuation or termination after a full program review is completed by the Dept. of Physics, Astrology and Meteorology which oversees this program.

On a motion by N. Cohen and seconded by P. Rosa, a vote was taken and the suspension of the WCSU Secondary Education: Earth and Planetary Sciences BS Option was unanimously approved.

c. Modifications

i. <u>Business Administration – AS – Housatonic CC</u>

Chair Harris called for a motion to approve the modification of the Housatonic CC AS in Business Administration. The motion was moved by P. Rosa and seconded by N. Cohen.

Robin Avant, Dean of Academic Affairs presented the program for Housatonic CC which is proposing the addition of a fully online alternate modality to the existing on ground modality for the AS in Business Administration. Housatonic CC is an NC-SARA affiliate. Provost Gates noted that there is an initiative for all CSCU community colleges to become NC-SARA approved so that students out of state can take CSCU online courses and programs.

Questions from the Committee centered on:

- *a)* Why is this program 60-62 Credits? Response: Some students may take additional credits. Math and Science course offerings are 3 or 4 credits. Most students take 3 credit courses.
- b) Duplication of on-ground and online programs Housatonic CC did use the Tunxis CC online Business Administration program and Charter Oak SC as models in creating theirs. The Committee suggested that there should be a formalized process for sharing information/best practices when creating online program(s). As we move toward consolidation, we should look at how we duplicate programs across institutions. Provost Gates noted that there is a question on the Application for a New Program form which asks if this program is duplicated. If the answer is "yes", the institution must identify which other institutions are offering the program and justify why it's offering the same program.

Chair Harris called for a vote to approve the modification of the Housatonic CC AS in Business Administration and the vote was unanimous.

Chair Harris changed the order of the agenda by placing the discussion of the <u>Discontinuation of the CCSU – Institute of Technology and Business Development</u> before the discussion of new programs.

- e. CT State University Centers and Institutes
 - i. Discontinuation

1. CCSU - Institute of Technology and Business Development

Chair Harris called for a motion to approve the discontinuation of the CCSU Institute of Technology and Business Development (ITBD). The motion was moved by N. Cohen and seconded by P. Rosa. Dr. Christopher Galligan, Vice President, Institutional Advancement, presented for CCSU. The decision to discontinue the ITBD, effective June 30, 2019, was based on economics and CCSU's ability to keep pace with technology and market changes. The committee views the discontinuation as an opportunity to create a revenue-generating operation which will foster community engagement, entrepreneurship, engage students and faculty, and will provide students the opportunity to incubate their ideas, which will also produce revenue. In response to Chair Harris' question on Continuing Ed., Dr. Galligan noted that Professional Education along with other functions will transition to Continuing Ed. The Life and Leisure Program (for alumni), youth programs, entrepreneurial programs for current students and conferencing will remain and be enhanced. The proposal for the new entity will be submitted to President Toro in Fall 2019 and the proposed new entity will be in place by January 2020. The committee plans to survey the campus community for feedback on the plan. Provost Gates cautioned CCSU to review the BOR policy for the establishment of a Center or Institute to ensure that the new entity meets BOR standards.

Chair Harris called for a vote to approve the discontinuation of the CCSU Institute of Technology and Business Development and the vote was unanimous. d. New Programs

i. Child Studies - BS - Charter Oak SC

Chair Harris called for a motion to approve the new Charter Oak SC BS in Child Studies program. The motion was moved by P. Rosa and seconded by N. Cohen. Provost Shirley Adams presented for Charter Oak SC. Over the years, COSC looked at many of its concentrations and moved them to majors. A year ago, four of the five Early Childhood Education tracks were moved to a major. COSC is proposing that the last track, Child Studies, be approved for a major, which will prepare students to get a Master's degree in teaching.

Chair Harris called for a vote to approve the new Charter Oak SC BS in Child Studies program and the vote was unanimous.

ii. <u>Data Science – Certificate – Northwestern CT CC</u>

Chair Harris called for a motion to approve the new Northwestern CT CC Certificate in Data Science program. The motion was moved by N. Cohen and seconded by P. Rosa. Dr. David Ferreira, Dean of Academic and Student Affairs, President Michael Rooke, and Professor Crystal Wiggins, Mathematics, presented for NCCC. President Rooke stated that Northwestern CT CC is the first community college to offer a Certificate in Data Science. By Fall 2019, NCCC will move forward an Associate's degree in Data Science to the Academic Council, then to the ASA Committee and the BOR for approval. Professor Wiggins discussed the changes in the Data Science employment field. This degree can be taken as a hybrid with some on ground classes or fully online.

A substitute motion was made by N. Cohen and seconded by P. Rosa to approve the Northwestern CT CC Certificate in Data Science that can be taken as a hybrid or completely online program. Chair Harris called for a vote on the substitute motion and it was unanimously approved.

- f. Appointment of CSU Professors
 - i. Michèle Bacholle ECSU

Provost William Salka spoke in support of Dr. Bacholle's nomination as a CSU Professor. On a motion by N. Cohen seconded by P. Rosa, a vote was taken to approve the nomination of Dr. Michèle Bacholle of Eastern CT State University as a CSU Professor and the vote was unanimous.

g. <u>BOR Policy - Amendment to Satisfactory Progress Policy</u>

Chair Harris noted that the incorrect policy, the Amendment to Academic Progress Policy for Student Financial Aid Recipients, was included in the BOR ASAC agenda packet for the June 7, 2019 meeting. The correct policy amendment: Satisfactory Progress – Statement on Satisfactory Progress, was distributed to the BOR ASA Committee. **Chair Harris called for a motion to approve the proposed amendment to the BOT of the Community Technical Colleges Section Three – Academic Affairs 3.8 Satisfactory Progress policy. The motion was moved by P. Rosa and seconded by N. Cohen. Arthur Poole, Director of Educational Opportunity, presented the policy and the amendment noting that the BOT for the Community Technical Colleges policy on Satisfactory Progress allows students to retake a course a second time. This is not allowed by some accrediting agencies for professional programs. The Nursing Program is a good example of a program where the accrediting requirements allow** only one retake of a course. Several of the Nursing Directors were in attendance to respond to questions regarding the amendment.

Chair Harris called for a vote to approve the proposed amendment to the BOT of the Community Technical Colleges Section Three – Academic Affairs 3.8 Satisfactory Progress policy and the vote was unanimous.

ADDITIONAL DISCUSSION ITEMS

A. BOT/BOR Policies

Regent Cohen suggested a review of all BOT/BOR policies. Dr. Ken Klucznik noted that, this summer, the Students First Committee is doing an audit of existing BOT/BOR policies with a focus on academic policies and the community colleges. A workgroup will be created to review the policies in Fall 2019. Regent Cohen requested a list of existing BOT/BOR policies when it is created.

B. <u>Data Science – Certificate – Northwestern CT CC</u> – New Program Chair Harris stated that Northwestern CT CC should have a marketing plan for the proposed new Data Science Certificate.

C. CSCU Online Programs - Market Penetrations

Provost Gates noted that this summer, consultants will review market penetrations of CSCU's online programs and identify areas with the highest growth. The findings will be shared with all CSCU community colleges and the CT State Universities. Dr. Harris requested that the ASA Committee receive the results of this review.

On a motion by N. Cohen and seconded by P. Rosa, the Committee voted unanimously to adjourn the meeting of the BOR Academic and Student Affairs Committee at 10:55 a.m.

CT BOARD OF REGENTS FOR HIGHER EDUCATION

RESOLUTION

concerning

Program Discontinuation

September 19, 2019

RESOLVED: That the Board of Regents for Higher Education approve the discontinuation of a program in Women's Studies (CIP Code: 05.0207 / OHE # 16954) leading to a Certificate at Three Rivers Community College, with a two-year phase out/teach out period ending Spring Semester 2021.

A True Copy:

Erin A. Fitzgerald, Secretary of the CT Board of Regents for Higher Education

ITEM

Discontinuation of a program in Women's Studies leading to a Certificate at Three Rivers Community College

BACKGROUND

Summary

As a result of a periodic academic program review, it was determined that the program has a very low enrollment, deemed not sufficient for the current financial environment.

Phase-Out/Teach-Out Strategy

Any student currently enrolled will be able to take requisite courses since all the program's courses are part of the Liberal Arts and Science Degree.

Resources

No additional resources are required for the discontinuation of this program.

RECOMMENDATION

It is the recommendation of the System's Provost and Senior Vice President for Academic and Students Affairs that the Board of Regents approve discontinuation of this program.

09/06/2019 – BOR Academic & Student Affairs Committee 09/19/2019 – Board of Regents

SECTION 1: GENERAL INFORMATION								
Institution: Three Rivers Community College Dat	te of Submission to CSCU Office of the Provost: 05/29/201	9						
Discontinued Program: Women's Studies Certificate CIP: 050207 OHE#: 16954 Accreditation Date: 5/17/2012 Phase Out /Teach Out Period 2 years Expected Date of Program Termination Spring 2021								
Program Characteristics Name of Program: Women's Studies Certificate Degree: Title of Award (e.g. Master of Arts) Certificate: (specify type and level) C2 Modality of Program: On ground								
Institution's Unit <i>(e.g. School of Business)</i> and Location <i>(e.g. main campus)</i> offering the Program: Three Rivers Community College								
Institutional Contact for this Proposal: Janet Hagen	Title: Professor of English and Women'sTel.: 860-215-9433 e-mail: jhagen@trcc.commnet.edu							

CSCU REVIEW STATUS (For System Office Use Only - please leave blank)

Notes regarding Application: Log of Steps Toward Approval: Date of Approval: Date for Inclusion in BOR-ASA Meeting Package: Conditions for Discontinuation Approval (if any) Comments:

SECTION 2: RATIONALE AND JUSTIFICATION FOR PROGRAM DISCONTINUATION

Narrative

Please consider whether discontinuation: a) occurs in the context of a related academic improvement, e.g., the merging of programs with declining enrollment/completions into a new program that effectively addresses relevant state needs and students' interests; b) emerge as a result of the periodic Academic Program Review for all programs at each institution, under the guidance of existing BOR policy; c) other institutional considerations such as redirecting capacity, adoption of new mission, etc. Provide any quantitative information in support of the discontinuation, including any relevant financial information. <u>Program discontinuation should not impact state priorities for workforce preparation</u>.

The elimination of this program is a result of the periodic Academic Program Review, under the guidance of the existing BOR policy for low enrollment. Given the current financial environment, the enrollment in this certificate does not support its continuation. Below is the program's enrollment for the last five years:

Program Description	Fall 14	Fall 15	Fall 16	Fall 17	Fall 18	5 – Year Average
Women's Studies		1		1		1

Source data: TRCC Inst. Research Fact Book

Phase Out/Teach Out Strategy

Please describe how the institution will ensure that students currently enrolled will be provided opportunities to complete the program. Provide quantitative information as needed (e.g. enrollments, any special resources needed, etc.)

Students who registered for this certificate program will not have any difficulty completing the certificate's requirements during phase-out, as the courses are part of the Liberal Arts and Science Degree. Students will continue to be advised during the phase-out period.

CT BOARD OF REGENTS FOR HIGHER EDUCATION

RESOLUTION

concerning

Program Discontinuation

September 19, 2019

RESOLVED: That the Board of Regents for Higher Education approve the discontinuation of a program in Laser and Fiber Optic Technology (CIP Code: 15.0304 / OHE # 08982) leading to a Certificate at Three Rivers Community College, with a two-year phase out/teach out period ending Spring Semester 2021.

A True Copy:

Erin A. Fitzgerald, Secretary of the CT Board of Regents for Higher Education

ITEM

Discontinuation of a program in Laser and Fiber Optic Technology leading to a Certificate at Three Rivers Community College

BACKGROUND

Summary

Per a periodic academic program review for the institution's manufacturing program, changes were made to the Electrical Robotics and laser program, phasing out laser courses and making this program non-sustainable. Additionally, student interest in the program has been declining over the last several years.

Phase-Out/Teach-Out Strategy

During the phase-out/teach-out period through the 2021 Spring Semester, students currently enrolled will be able to take requisite courses. After this period, students interested in receiving a manufacturing certificated will be informed of alternative courses and other options will be explored with the student on a case-by-case basis.

Resources

No additional resources are required for the discontinuation of this program.

RECOMMENDATION

It is the recommendation of the System's Provost and Senior Vice President for Academic and Students Affairs that the Board of Regents approve discontinuation of this program.

09/06/2019 – BOR Academic & Student Affairs Committee 09/19/2019 – Board of Regents

SECTION 1: GENERAL INFORMATION							
Institution: Three Rivers Community College D	ate of Submission to CSCU	Office of the Provost: 5/30/19					
Discontinued Program: Laser and Fiber Optic Technology C	ertificate CIP: 150304	OHE#: 08982					
Accreditation Date: 4/20/2001							
Phase Out /Teach Out Period Spring 2019 – Spring 2020 Expected Date of Program Termination May 2021							
Program Characteristics							
Name of Program: Laser and Fiber Optic Technology Certificate							
Degree: Title of Award (e.g. Master of Arts)							
Certificate: (specify type and level) Community College Certific	cate						
Modality of Program: X On ground Online Combine	d						
Institution's Unit (e.g. School of Business) and Location (e.g. ma Department	ain campus) offering the Proc	gram: Business and Technology					
Institutional Contact for this Proposal, Michael Control	Title: Mfa DC	Tel.: 860 215 9428					
institutional contact for this Proposal: witchael Gentry	The: Mig PC	E-mail: mgentry@trcc.commnet.edu					

CSCU REVIEW STATUS (For System Office Use Only - please leave blank)
Notes regarding Application:
Log of Steps Toward Approval:
Date of Approval:
Date for Inclusion in BOR-ASA Meeting Package:
Conditions for Discontinuation Approval (if any)
Comments:

SECTION 2: RATIONALE AND JUSTIFICATION FOR PROGRAM DISCONTINUATION

Narrative

Please consider whether discontinuation: a) occurs in the context of a related academic improvement, e.g., the merging of programs with declining enrollment/completions into a new program that effectively addresses relevant state needs and students' interests; b) emerge as a result of the periodic Academic Program Review for all programs at each institution, under the guidance of existing BOR policy; c) other institutional considerations such as redirecting capacity, adoption of new mission, etc. Provide any quantitative information in support of the discontinuation, including any relevant financial information. <u>Program discontinuation should not impact state priorities for workforce preparation</u>.

The program discontinuance was initiated by the Academic Program Review for the manufacturing program. The change of the Electrical Robotics and Laser program phasing out laser courses makes this a non-sustainable program. Interest among students and local industry has been declining over the last several years.

Given the current financial environment, the enrollment in this certificate does not support its continuation. Below is the enrollment for the last five years.

Major Code	Program Description	Fall 14	Fall 15	Fall 16	Fall 17	Fall 18	5 – Year Average
КК20	Laser and Fiber Optic Technology	1	1	0	0	2	1

Phase Out/Teach Out Strategy

Please describe how the institution will ensure that students currently enrolled will be provided opportunities to complete the program. Provide quantitative information as needed (e.g. enrollments, any special resources needed, etc.)

The two students registered as full time students should be able to complete the program before the end of the teach out. Once teach out begins, additional research and general communications will provide information to other students who may have an interest on what courses to take to receive a certificate in manufacturing, the most straightforward alternative. Other options can be explored on a case-by-case basis.

CT BOARD OF REGENTS FOR HIGHER EDUCATION

RESOLUTION

concerning

Program Discontinuation

September 19, 2019

RESOLVED: That the Board of Regents for Higher Education approve the discontinuation of a Laser Manufacturing degree option within the Manufacturing Engineering Technology program (CIP Code: 15.0613 / OHE # 15434) leading to an Associate of Science degree at Three Rivers Community College, with a two-year phase out/teach out period ending Spring Semester 2021.

A True Copy:

Erin A. Fitzgerald, Secretary of the CT Board of Regents for Higher Education

ITEM

Discontinuation of a Laser Manufacturing degree option within the Manufacturing Engineering Technology program leading to an Associate of Science degree at Three Rivers Community College

BACKGROUND

Summary

Per a periodic academic program review for the institution's manufacturing program, changes were made to the Electrical Robotics and laser program, phasing out laser courses and making this program non-sustainable. Additionally, student interest in the program has been declining over the last several years.

Phase-Out/Teach-Out Strategy

During the phase-out/teach-out period through the 2021 Spring Semester, the one student currently enrolled will be able to complete requisite courses. After this period, students interested in receiving a degree in manufacturing will be informed of alternative courses and other options will be explored with the student on a case-by-case basis.

Resources

No additional resources are required for the discontinuation of this program.

RECOMMENDATION

It is the recommendation of the System's Provost and Senior Vice President for Academic and Students Affairs that the Board of Regents approve discontinuation of this program.

09/06/2019 – BOR Academic & Student Affairs Committee 09/19/2019 – Board of Regents

SECTION 1: GENERAL INFORMATION Institution: Three Rivers Community College Date of Submission to CSCU Office of the Provost: 5/30/19 Discontinued Program: Manufacturing Engineering Technology: Laser Mfg Op CIP: 150613 OHE#: 15434 Accreditation Date: not available Phase Out /Teach Out Period Spring 2019-Spring 2021 Expected Date of Program Termination May 2021 **Program Characteristics** Name of Program: Manufacturing Engineering Technology: Laser Mfg Op Degree: Title of Award (e.g. Master of Arts) Associate in Science Certificate: (specify type and level) Modality of Program: X On ground Online Combined Institution's Unit (e.g. School of Business) and Location (e.g. main campus) offering the Program: Business and Technology Department Tel.: 860 215 9428 Institutional Contact for this Proposal: Michael Gentry Title: Mfg PC E-mail: mgentry@trcc.commnet.edu

CSCU REVIEW STATUS (For System Office Use Only - please leave blank)
Notes regarding Application:
Log of Steps Toward Approval:
Date of Approval:
Date for Inclusion in BOR-ASA Meeting Package:
Conditions for Discontinuation Approval (if any)
Comments:

SECTION 2: RATIONALE AND JUSTIFICATION FOR PROGRAM DISCONTINUATION

Narrative

Please consider whether discontinuation: a) occurs in the context of a related academic improvement, e.g., the merging of programs with declining enrollment/completions into a new program that effectively addresses relevant state needs and students' interests; b) emerge as a result of the periodic Academic Program Review for all programs at each institution, under the guidance of existing BOR policy; c) other institutional considerations such as redirecting capacity, adoption of new mission, etc. Provide any quantitative information in support of the discontinuation, including any relevant financial information. <u>Program discontinuation should not impact state priorities for workforce preparation</u>.

The program discontinuance was initiated by the Academic Program Review for the manufacturing program. The change of the electrical Robotics and Laser program phasing out laser courses makes this a non-sustainable degree. Interest among students and local industry has been declining over the last several years.

Major Code	Program Description	Fall 14	Fall 15	Fall 16	Fall 17	Fall 18	5 – Year Average
KB72	Mfg Eng Tech: Laser Mfg Op	1	0	3	2	1	2

Phase Out/Teach Out Strategy

Please describe how the institution will ensure that students currently enrolled will be provided opportunities to complete the program. Provide quantitative information as needed (e.g. enrollments, any special resources needed, etc.)

The one student registered as a full time student will graduate this May. Once the teach out begins, additional research and general communications will provide information to other students who may have an interest on what courses to take to receive an Associates Degree in Manufacturing Engineering Technology or an AAS in General Engineering Technology, the 2 most straightforward alternatives. Other options can be explored on a case-by-case basis.

CT BOARD OF REGENTS FOR HIGHER EDUCATION

RESOLUTION

concerning

Program Modification

September 19, 2019

RESOLVED: That the Board of Regents for Higher Education approve the modification of an online program – Data Mining (CIP Code: 11.0401, OHE # 09328) leading to a Master of Science degree at Central Connecticut State University; specifically, curricular changes and a name change in the program's title from Data Mining to Data Science.

A True Copy:

Erin A. Fitzgerald, Secretary of the CT Board of Regents for Higher Education

ITEM

Modification of an online program, Data Mining at Central Connecticut State University

BACKGROUND

Summary

The institution proposes to change the title of the referenced program to Data Science. Curricular changes reduce the required course credits from 33 to 31 and create a five-track system for the new degree, four of which reflects specialized areas pertinent to employers and a general track. This curricular change will also require changes its CIP Code to 30.3001 to better reflect the new curriculum.

Rationale

The term data mining has evolved into something rather pejorative implying looking largely for spurious results in datasets to confirm a post hoc prediction; thus, the name change. Data scientist are in high demand in the state and the proposed specialized curricular tracks respond to the needs demonstrated by large employers for bioinformatics, text analytics, clustering and computational specialization.

Resources

Hiring an adjunct instructor and devoting resources for marketing will be required to implement the proposed program modifications. Combined with the Official Certificate Program, it is expected that projected revenue from the two Data Science offerings will exceed their projected expenditures over the course of the next three years by more than \$25,000.

RECOMMENDATION

Following its review and deliberative process, it is the recommendation of the Academic Council that the Board of Regents approve this program modification. The System's Provost and Senior Vice President for Academic and Students Affairs concurs with this recommendation.

09/06/2019 – BOR Academic & Student Affairs Committee 09/19/2019 – Board of Regents

CONNECTICUT BOARD OF REGENTS FOR HIGHER EDUCATION Connecticut State Colleges & Universities

APPLICATION FOR MODIFICATION OF ACCREDITED PROGRAM

SECTION 1: GENER	AL INFORMATION
Institution: Central Connecticut State University Date of	of Submission to CSCU Office of the Provost: 05/01/2019
Most Recent NEASC Institutional Accreditation Action and Date	e: Fifth-year interim report accepted 11/07/2013
Original Program Characteristics CIP Code No. 110401 Title of CIP Code: Information Science/Studies Name of Program: Data Mining Degree: Title of Award (e.g. Master of Arts) Master of Science Certificate: (specify type and level) Date Program was Initiated: Fall semester, 2001 Modality of Program: On ground X Online Combined If "Combined", % of fully online courses? Total # Cr the Institution Requires to Award the Credential (i.e. include program credits, GenEd, other): 33	Original Program Credit Distribution # Cr in Program Core Courses: 27 # Cr of Electives in the Field: 6 # Cr of Free Electives: # Cr Special Requirements (include internship, etc.): Total # Cr in the Program (sum of all #Cr above): 33 From "Total # Cr in the Program" above, enter #Cr that are part of/belong in an already approved program(s) at the institution: 33
 Type of Program Modification Approval Being Sought (mark all the Licensure and Accreditation (specify whether New Certificate, Min X Significant Modification of Courses/Course Substitutions* Offering of Program at Off-Campus Location (specify new location (specify new location) of Program Using an Alternate Modality (e.g. from on X Change of Degree Title or Program Title 	at apply): or, Option, Concentration, or Other) tion) a ground to online)
 Modified Program Characteristics Name of Program: Data Science Degree: Title of Award (e.g. Master of Arts) Master of Science Certificate¹: (specify type and level) Program Initiation Date: Fall semester, 2019 Modality of Program: On ground X Online Combined If "Combined", % of fully online courses? Total # Cr the Institution Requires to Award the Credential (<i>i.e.</i> <i>include program credits, GenEd, other</i>): 31 Other: Student choice increased with the creation of five different tracks: four specialized and one general track. Also, we wish to change the CIP code to 30.3001 (Computational Science) to better reflect the content of our program. 	Modified Program Credit Distribution # Cr in Program Core Courses: 19 # Cr of Electives in the Field: 12 # Cr of Free Electives: # Cr Special Requirements (include internship, etc.): Total # Cr in the Program (sum of all #Cr above): 31 From "Total # Cr in the Program" above, enter #Cr that are part of/belong in an already approved program(s) at the institution: 19 core credits and two elective courses.
*Significant is defined as "more than 15 credits in a previously credits in a previously approved graduate degree program.	approved undergraduate degree program or more than 12

CSCU REVIEW STATUS (For System Office Use Only - please leave blank)

Notes regarding Application: Log of Steps Toward Approval: Date of Approval:

¹ If creating a Certificate program from existing courses belonging to a previously approved baccalaureate/associate degree program, enter information about that program in the "Original Program" section.

Date for Inclusion in BOR-ASA Meeting Package:

Comments:

Conditions for Approval (if any)

SECTION 1: GENERAL INFORMATION (continued)

If program modification is concurrent with discontinuation of related program(s), please list for such program(s): Program Discontinued: Data Mining M.S. CIP: 110401 OHE#: 009328 Accreditation Date: 2001 Phase Out Period **2019-2020** Date of Program Termination **Summer**, **2020**

Institution's Unit (e.g. School of Business) and Location (e.g. main campus) Offering the Program: Engineering, Science, and Technology

Other Program Accreditation:

- If seeking specialized/professional/other accreditation, name of agency and intended year of review:
- If program prepares graduates eligibility to state/professional license, please identify:

(As applicable, the documentation in this request should addresses the standards of the identified accrediting body or licensing agency)

Institutional Contact for this Proposal: Daniel Larose, PhD Title: Professor Tel.: 860-832-2862 e- mail: Iarosed@ccsu.edu

SECTION 2: BACKGROUND, RATIONALE AND NATURE OF MODIFICATION (Please Complete Sections as Applicable)

Background and Rationale (Please provide the context for and need for the proposed modification, and the relationship to the originally approved program)

As applicable, please describe:

• How does the program address CT workforce needs and/or the wellbeing of CT society/communities? (Succinctly present as much factual evidence and evaluation of stated needs as possible.)

In 2018, Bloomberg called data scientist "the hottest job in America." Business Insider called it "The best job in America right now." Glassdoor.com rated it the best job in the world in 2018 for the third year in a row. The Harvard Business Review called data scientist "The sexiest job in the 21st century."

LinkedIn's August 2018 Workforce Report found that there is a severe shortage of qualified data scientists, with America short 151,171 people with data science skills overall. "The need is particularly acute in New York City (short 34,032 people with data science skills)." The January 2019 report from Indeed.com, a leading jobs website, showed a 29% increase in demand for data scientists year-over-year, and a 344% increase since 2013.

Many of these jobs are right here in Connecticut. A March 20, 2019, search of Indeed.com found 1,729 data science jobs within 100 miles of Hartford, CT, 339 of which were entry level. Monster.com found over 3,000 data scientist jobs within 100 miles of Hartford. Most salary estimates were six figures.

Our Data Mining M.S. degree program began in 2001, and based on our experiences, we have redesigned this degree to remove eight credits of core courses to add five tracks: four tracks allow students to specialize in areas pertinent to Connecticut employers, and the fifth general track allows students to take classes from all other tracks. Doing the following job searches with Indeed.com restricted to Connecticut produced many hits for searches done in March, 2019. Data scientists specializing in the first track (bioinformatics, the analysis of biological data) are sought after by Pfizer, Yale New Haven Hospital, Techne Life Science, UConn Health Center, the Jackson Laboratory Cancer Center. Scientists in the second track (text analytics) appeal to business such as Travelers, Gartner, and Priceline.com. The third track (clustering) appeals to ESPN, Gartner, and Cigna. Finally, the fourth track (computational techniques) is sought after by The Hartford,

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Federal Bureau of Investigation (New Haven office), Unilever, and Pratt & Whitney. Clearly, graduates from all tracks would be in demand in Connecticut.

• How does the program make use of the strengths of the institution (e.g. curriculum, faculty, resources) and of its distinctive character and/or location?

The online Data Mining M.S. degree was the first such program in the world. Building on our past 18 years of experience, we propose to reduce the number of core credits from 27 to 19 in order to add four specialized tracks, which are (1) based on the research specialities of current faculty and (2) reflect the needs of Connecticut employers. On the second point, as noted above, job searches on Indeed.com restricted to Connecticut produce ads from well-known companies such as Pfizer, Yale New Haven Hospital, Travelers, Gartner, ESPN, Cigna, Pratt & Whitney, and Unilever among others. Hence, we are leveraging the expertise of our faculty while meeting present employer demand in Connecticut.

• Please describe any transfer agreements with CSCU institutions that will become instituted as a result of the approval of this program. (Please highlight details in the Quality Assessment portion of this application, as appropriate.)

n/a

 Please indicate what similar programs exist in other institutions within the CSCU System, and how unnecessary duplication is being avoided.

As mentioned earlier, CCSU was the first university in the world to offer a completely online Master of Science degree in data mining. Essentially, we have been doing data science since 2001. But back then, the term "data science" had not been invented yet. Today, the term "data mining" has evolved into something rather pejorative, similar to "data dredging" or 'fishing", which involves looking for (largely) spurious results in datasets to confirm a post hoc prediction. Thus, the name change.

WCSU and ECSU do not have any programs in data science. SCSU has new programs offering a B.S. and an M.S. in data science. SCSU emphasizes that their M.S. degree will be a Professional Science Masters (PSM), which means the degree caters to students who want to acquire "professional skills" (i.e., business skills). By contrast, CCSU's data science M.S. is focused on developing programming skills, using software packages, and understanding the underlying statistical, computational, and database aspects of data mining/data science. Thus, there is room for both programs in the state of Connecticut to satisfy the already high and growing demand.

• Please provide a description/analysis of employment prospects for graduates of this proposed program.

To reiterate some of the rationale: Data scientists are in demand in Connecticut. There are between 1,700 and 3,000 data science jobs within 100 miles of Hartford, CT. Most salary estimates were six figures. Data scientists specializing in bioinformatics are sought after by Pfizer, Yale New Haven Hospital, Techne Life Science, UConn Health Center, and the Jackson Laboratory Cancer Center. Scientists in text analytics appeal to business such as Travelers, Gartner, and Priceline.com. Scientists completing the clustering track would appeal to ESPN, Gartner, and Cigna. Scientists with computational specialization are sought after by The Hartford, Federal Bureau of Investigation (New Haven office), Unilever, and Pratt & Whitney.

Description of Modification (Please provide a summary of the modifications to curriculum, admissions or graduation requirements, mode of delivery, etc., and concisely describe how the institution will support these changes.

Admission requirements have changed in one way – reducing the number of recommendation letters to one rather than two. Note that the M.S. is still entirely online. The main difference is the addition of four tracks so that students can specialize, and the fifth track allows students to pick classes from different tracks or from electives. The rest of the changes have been made to the curriculum as detailed below.

The existing data mining M.S. has six required core courses (four credits each) plus the capstone (three credits), and totals 33 credits. This proposal reduces the required number of core courses to four. The two classes dropped from the core were STAT 526, Data Mining for Genomics and Proteomics, and STAT 527, Text Mining. Both of these were expanded into a track consisting of three 4-credit courses. In addition, two more tracks were developed: Advanced Methods, and Computational Methods (the latter overseen by the Computer Science Department.) Consequently, the M.S. degree has dropped from 33 credits to 31, so the latter is a little less expensive for students, and the number of classes has dropped from 9 to 8 (in three of the tracks), so most students will be able to graduate a little quicker.

Finally, although the data science M.S. is adding new classes, these classes can be handled by existing faculty. First, the computer science track consists of classes that currently run in their department, so there is no additional teaching load. Second, although the three specialized tracks add new classes, existing faculty can cover these at current student levels because we will change from scheduling all the same classes every year to scheduling some classes odd years and others even years. (We do not expect this to delay student graduation, as most students attend part time, and the Program Advisor may substitute courses for students on a deadline.) Third, currently our classes are typically run between 50% and 100% capacity, so we can handle a growing population of students for several years with existing faculty. Fourth, even large numbers of new students could be handled by hiring one or more adjuncts to teach current faculty's introductory-level statistics courses. Details on this are given in Section 3 of this form.

Description of Resources Needed (As appropriate please summarize faculty and administrative resources, library holdings, specialized equipment, etc. Details to be provided in the next section, as appropriate)

Given that we are modifying an existing online M.S. program, the main concern is covering new classes for three of the proposed specialized tracks (the fourth track is based on currently running classes in the Computer Science Department, and the fifth track will consist of classes taught in the other tracks, so it doesn't require more faculty load). However, instead of offering the same courses every year, which is done for our current program, we have developed a two-year cycling of classes, which allows the current faculty to teach the larger number of classes. We will need to hire one adjunct instructor to teach introductory-level statistics course, as reflected in the pro-forma budget below.

All program courses are taught by full-time faculty. No new library resources will be required beyond what we can obtain through the Department of Mathematical Sciences, as has been the case since 2001. No new computing equipment or software is required, nor is any software licensing. The faculty coordinator reviews applications, fields inquiries about the program, and We have had a Graduate Assistant every semester since 2001, who helps the students navigate the steep learning curve with the new data science software.

To initiate and sustain this growth, we need to devote resources to *marketing*. Until now, there has been no advertising or marketing of our data mining programs. Marketing plans include:

- Partnering with the American Statistical Association to sponsor an annual Data-thon, where teams would compete to solve a business problem using analytics.
- Getting the word out that the textbooks written by our faculty, including Data Mining and Predictive Analytics (Larose and Larose, Wiley, 2015) have been adopted by data science programs, worldwide.

Other Considerations

Previous Three Years Enrollment and Completion for the Program being Modified

ACTUAL Enrollment	Fall Term, 2018		Fall Term, Year 2017		Fall Term, Year 2016	
	Full Time	Part Time	Full Time	Part Time	Full Time	Part Time
Transfers In	0	0	0	0	0	0
New Students	0	5	0	5	0	3
Returning Students	0	13	0	12	1	23
ACTUAL Headcount Enrollment	0	18	0	17	1	26
Fall FTE accounted for by Program Majors*	6.5		5.5		11	
Size of Credentialed Group(s) for Given Year	N/A		3		5**	

*FTE is considered 12 credits for graduate students. Part-time students are calculated at 1/3 FTE.

**Graduation rate for AY15-16 was 7 students.

Curriculum Details for a Pro	ogram N	Nodification	(to be used	l as appropriate for specific modification reques	t)2	
Course Number and Name ³	L.O. #	Pre- Requisite	Cr Hrs	Course Number and Name	L.O. #	Cr Hrs
Program Core Courses				Tracks, continued		
Core: DATA 511, Introduction Data Science		none	4	Track 2: DATA 531, Text Analytics with Information Retrieval		4
Core: DATA 512, Predictive Analytics, Estimation and Clustering		DATA 511	4	Track 2: DATA 532, Text Analytics with Natural Language Programming		4
Core: DATA 513, Predictive Analytics, Classification		DATA 511	4	Track 2: Elective		4
Core: DATA 514, Multivariate Analytics		DATA 511	4	Track 3: DATA 541, Advanced Estimation Methods		4
Track 1: DATA 521, Introduction Bioinformatics			4	Track 3: DATA 542, Advanced Clustering Methods		4
Track 1: DATA 522, Mining Gene and Protein Expression Data			4	Track 3: DATA 543, Advanced Classification Methods		4
Track 1: DATA 525, Biomarker Discovery			4			
Tracks, continued				Elective Courses in the Field		
Track 4: CS 508, Distributed Computing			3			
Track 4: CS 570, Topics in Artificial Intellige	ence		3			
Track 4: CS 580, Topics in Database Syste Applications	ems and		3			
Track 4: CS 563 or CS 525, Algorithms		3				
Track 5: 12 credits worth of classes from the	ne other	tracks	12			
Total Other Credits Required to Issue Modif	ied Cred	lential				

² Details of course changes for Community College institutions should be provided with enough detail to introduce necessary changes in the centralized programmatic database for that system.

³ Make any detailed annotations for individual courses as needed to understand the curricular modifications taking place

Learning Outcomes - L.O. (Please list up to seven of the most important student learning outcomes for the program, and any changes introduced)

- 1. Evaluate, via a systematic process, the true consequences of making false positive or false negative decisions.
- 2. Apply data science using a systematic process by implementing an adaptive and iterative framework that includes the following phases: research understanding, data understanding, data exploration, data modeling, evaluation, and deployment.
- 3. Demonstrate proficiency with leading open-source analytics software such as R and Python, as well as commercial platforms such as IBM/SPSS Modeler.
- 4. Understand and apply a wide range of clustering, estimation, prediction, and classification algorithms.
- 5. Demonstrate specialized skills in bioinformatics, text analytics, advanced methods, and/or algorithms.

CONNECTICUT BOARD OF REGENTS FOR HIGHER EDUCATION Connecticut State Colleges & Universities APPLICATION FOR MODIFICATION OF ACCREDITED PROGRAM SECTION 3: RESOURCE AND FINANCIAL CONSIDERATIONS

Two-Year Cost Effectiveness and Availability of Adequate Resources

Floatives

(Please complete the Pro-Forma Budget – Projected Revenues and Expenditures on the following page. Provide any necessary annotations for the Pro-Forma Budget and other commentary regarding the cost effectiveness and availability of adequate resources for the proposed modification below:

Instead of offering the same courses every year, which is done for the current program, we have developed a two-year cycling of classes, which allows the current faculty to teach the larger number of classes. We do not expect this to delay student graduation, as most students are part time, and the Program Advisor may substitute courses for students on a deadline.

Core Courses for existing Data Mining M.S.		Cycling	
STAT 520	Fall		All
STAT 521	Fall	Spring	All
STAT 522		Spring	All
STAT 523	Fall		All
STAT 526	Fall		All
STAT 527		Spring	All

STAT 525SpringAllSTAT 529Irregular	Liectives		
STAT 529 Irregular	STAT 525	Spring	All
Siiii 52)	STAT 529	Irregular	

The existing data mining M.S. requires the faculty to teach a little more than 8 courses per academic year. The "little more than" is due to STAT 529, which is a topics course that has been used to pilot new courses developed for the data science program. Here is the new course cycling.

Core Courses for proposed Data Science M.S.		Cycling	
DATA 511 Introduction to Data Science.	Fall	Spring	All
DATA 512 Predictive analytics: Estimation and Clustering.		Spring	All
DATA 513 Predictive analytics: Classification	Fall		All
DATA 514 Multivariate Analytics.	Fall		All
Bioinformatics Track			
DATA 521 Introduction to Bioinformatics	Fall		Odd
DATA 522 Mining Gene and Protein Expression Data.		Spring	Odd
DATA 525 Biomarker Discovery.	Fall		Even
Text Analytics Track			
DATA 531 Text Analytics with Information Retrieval.		Spring	Odd
DATA 532 Text Analytics with Natural Language Processing.		Spring	Even
Non-core 500-level DATA course			
Advanced Methods Track			
DATA 541 Advanced Estimation Methods.	Fall		Odd
DATA 542 Advanced Clustering Methods.	Fall		Even
DATA 543 Advanced Classification Methods		Spring	Even
Computational Track*			
CS 463 Algorithms		Spring	
CS 508 Distributed Computing		Spring	
CS 525 Advanced Algorithms	Fall		

		D I NO OIUI	
CS 570 Topics in Artificial Intelligence		Spring	
CS 580 Topics in Database Systems and Applications	Fall		

*CS courses are mostly, but not exclusively online. Most courses have been offered in an online format.

General Data Science Track

12 credits of non-core 500-level DATA and/or CS courses listed within the computational track

Annotations for the pro-forma budget:

¹We expect enrollments to consist of primarily part-time students because our students are typically employed. We believe that tailoring our program to address the need for training in specialized applications of data science (i.e., the four proposed tracks) will increase enrollment by 20% per year for the next three years, resulting in total enrollments of 22, 26, and 31 part-time students each year.

²Tuition reflects 2018-19 current per credit costs; it does not include any other general, online or university fees nor assumes tuition increases for 2019-22. Tuition in this program is \$683 per credit regardless of part-time or full-time status. Part-time students are estimated to take 5 credits per semester.

³Other revenue reflects the \$50 per course fee for online courses. The expected seat count across all online Data Science courses is estimated conservatively at 42, 46, and 52 seats for the next 3 years.

⁴These program expenditures reflect those of the Data Science program, which incorporates the OCP and MS.

⁵A faculty member receives 3 credits of reassignment per semester to administer the Data Science program. The cost reflects 12.5% of the faculty member's base salary plus 48% in estimated fringe. Further, the increase across 3 years reflects the 3.7% contractual increase in salary through AY2020 as reflected in Articles 12.3 and 12.4 of the AAUP Contract.

⁶Currently, full-time faculty teach 30 credits per academic year within the Data Science program (both Master's and OCP). Across the next 3 years, we expect the number of credits offered by full-time faculty to increase to 24 in FY19, 27 in FY20, and 34 in FY21. We assume half of these credits to be offered each Fall. We scaled the salary of each faculty member teaching in the program to the number of credits they teach across the academic year and divided by 2 to obtain the Fall semester cost. In Fall 2018, 78 student credit hours were generated by students enrolled in the program (MS and OCP). However, the faculty taught 128 total student credit hours in program courses. Thus, the true cost of faculty teaching within the program was scaled to the student credit hours expected for program candidates as a function of total student credit hours expected. The scaling rates projected for the next 3 years based on enrollment increases within the total program (MS and OCP) are .65, .68, and .71, respectively. We should also note that the proportion of program student credit hours for computer science courses will be far below these scaling rates. As such, the estimates for faculty cost are likely overestimates. We estimated fringe at 48%. The increase across years represents a 3.7% change in salary through AY2020 as reflected in Articles 12.3 and 12.4 of the AAUP Contract. (Note: Faculty members teaching within the program and/or their ranks may change within 3 years.)

⁷We assume one additional undergraduate section taught each year by an adjunct at the Level C rate. Fringe benefits are estimated at 31%. Rates and increases reflect Article 12.7.6 of the CSU-AAUP contract.

⁸The cost of a GA is \$5400 per year, or \$2700 per semester. We also estimate \$1000 per semester in marketing costs.

PRO FORMA Budget - Projected Revenues and Expenditures (Whole Dollars Only)

PROJECTED Program Revenue for MS ¹	Spring 2020	Spring 2021	Spring 2022
Tuition (do not include internal transfers) ²	\$ 75,130	\$ 88,790	\$ 105,865
Program-Specific Fees	\$-	\$-	\$-
Other Revenue (Online course fees) ³	\$ 2,000	\$ 2,300	\$ 2,600
Total Estimated Program Revenue	\$ 77,130	\$ 91,090	\$ 108,465

PROJECTED Program Expenditures*4	Spring 2020	Spring 2021	Spring 2022
Administration (Chair or Coordinator) ⁵	\$ 21,136	\$ 21,918	\$ 21,918
Faculty (Full-time, total for program) ⁶	\$ 52,741	\$ 65,132	\$ 81,883
Faculty (Part-time, total for program) ⁷	\$ 6,830	\$ 7,204	\$ 7,204
Support Staff	n/a	n/a	n/a
Library Resources Program	n/a	n/a	n/a
Equipment (List as needed)	n/a	n/a	n/a
Other (e.g. student services) ⁸	\$ 3,700	\$ 3,700	\$ 3,700
Estimated Indirect Costs (e.g. student services, operations, maintenance)	n/a	n/a	n/a
Total Estimated Program Expenditures	\$ 84,406	\$ 97,953	\$ 114,704

*Note: Capital outlay costs, institutional spending for research and services, etc. can be excluded. ⁹The expenses listed above reflect the combined expenses of the OCP and MS. Comparing combined expenses to revenue generated only by the MS might lead to the conclusion that expenses outweigh revenue. Thus, it is instructive to scale the expenses of the MS relative to the revenue of the entire Data Science program. The table below reports the total revenue of the Data Science program (OCP + MS) and the proportion of revenue attributable only to the OCP. For example, the total program revenue for Spring 2020 is expected at \$88,790. Revenue generated by the MS (\$77,130) would be 84.6% of this total. We then applied this scaling factor to the total expenses to estimate the true cost of the MS alone (\$12,999) in Spring 2020. Comparing MS expenditures to MS revenues (or total expenditures to total program revenue) demonstrates that revenue is expected to exceed expenditures starting in Spring 2020.

PROJECTED Expenditures for the MS⁹	Spring 2020	Spring 2021	Spring 2022	
Total Program Revenue [OCP+MS]	\$ 88,790	\$ 105,865	\$ 126,355	
Proportion of Total Program Revenue from MS	0.846 0.839		0.839	
Total Expenditures Assignable to MS	\$ 71,408	\$ 82,183	\$ 96,237	

This PRO FORMA Budget provides reasonable assurance that the proposed program modification can be established and is sustainable. Some assumptions and/or formulaic methodology may be used and annotated in narrative on page 4 of Application.

CT BOARD OF REGENTS FOR HIGHER EDUCATION

RESOLUTION

concerning

Program Modification

September 19, 2019

RESOLVED: That the Board of Regents for Higher Education approve the modification of a program – Data Mining (CIP Code: 27.0301, OHE # 09289) leading to an Official Certificate at Central Connecticut State University

A True Copy:

Erin A. Fitzgerald, Secretary of the CT Board of Regents for Higher Education

ITEM

Modification of an Official Certificate Program, Data Mining at Central Connecticut State University

BACKGROUND

Summary

The institution proposes to change the title of the program to Data Science and make curricular changes in the certificate by expanding the required elective courses to 8-10 credits from 6-8; thus increasing the total credits required to 20-22 from 18-20. This curricular change will also require changes its CIP Code to 30.3001 to better reflect the new curriculum.

Rationale

The term data mining has evolved into something rather pejorative implying looking largely for spurious results in datasets to confirm a post hoc prediction; thus, the name change. Data scientist are in high demand in the state and the proposed changes in the certificate is expected to attract more students to respond to the needs demonstrated by large employers for bioinformatics, text analytics, clustering and computational specialization.

Resources

Existing faculty will develop and teach the new electives under a new two-year cycle of offering the classes. Additional resources are required hire one adjunct instructor and to implement a marketing plan. Nevertheless, projected revenue is expected to exceed projected expenditures over the course of the next three years for the Data Science program which incorporates the OCP and Master of Science degree.

RECOMMENDATION

Following its review and deliberative process, it is the recommendation of the Academic Council that the Board of Regents approve this program modification. The System's Provost and Senior Vice President for Academic and Students Affairs concurs with this recommendation.

09/06/2019 – BOR Academic & Student Affairs Committee 09/19/2019 – Board of Regents

CONNECTICUT BOARD OF REGENTS FOR HIGHER EDUCATION Connecticut State Colleges & Universities

APPLICATION FOR MODIFICATION OF ACCREDITED PROGRAM

SECTION 1: GENER	AL INFORMATION		
Institution: Central Connecticut State University Date of	of Submission to CSCU Office of the Provost: 05/01/2019		
Most Recent NEASC Institutional Accreditation Action and Date	e: Fifth-year interim report accepted 11/07/2013		
 Original Program Characteristics CIP Code No. 270301 Title of CIP Code: Applied Mathematics, General Name of Program: Data Mining Degree: Title of Award Official Certificate Program Certificate: (specify type and level) Date Program was Initiated: ? Modality of Program: On ground X Online Combined If "Combined", % of fully online courses? Total # Cr the Institution Requires to Award the Credential (i.e. include program credits, GenEd, other): 18-20 Type of Program Modification Approval Being Sought (mark all th Licensure and Accreditation (specify whether New Certificate, Min X Significant Modification of Courses/Course Substitutions* Offering of Program at Off-Campus Location (specify new loca Offering of Program Using an Alternate Modality (e.g. from on X Change of Degree Title or Program Title 	Original Program Credit Distribution # Cr in Program Core Courses: 12 # Cr of Electives in the Field: 6-8 # Cr of Free Electives: # Cr Special Requirements (include internship, etc.): <u>Total # Cr in the Program</u> (sum of all #Cr above): 18-20 From "Total # Cr in the Program" above, enter #Cr that are part of/belong in an already approved program(s) at the institution: 18-20 hat apply): or, Option, Concentration, or Other) tion) ground to online)		
 Modified Program Characteristics Name of Program: Data Science Degree: Title of Award: Official Certificate Program Certificate¹: (specify type and level) Program Initiation Date: Fall semester, 2019 Modality of Program: On ground X Online Combined If "Combined", % of fully online courses? Total # Cr the Institution Requires to Award the Credential (i.e. include program credits, GenEd, other): 20-22 Other: We wish to change the CIP code to 30.3001 (Computational Science) to better reflect the content of our program. *Significant is defined as "more than 15 credits in a previously 	Modified Program Credit Distribution # Cr in Program Core Courses: 12 # Cr of Electives in the Field: 8-10 # Cr of Free Electives: # Cr Special Requirements (include internship, etc.): Total # Cr in the Program (sum of all #Cr above): 20 From "Total # Cr in the Program" above, enter #Cr that are part of/belong in an already approved program(s) at the institution: 20-22		

credits in a previously approved graduate degree program.

CSCU REVIEW STATUS (For System Office Use Only - please leave blank)

Notes regarding Application: Log of Steps Toward Approval: Date of Approval: Date for Inclusion in BOR-ASA Meeting Package:

¹ If creating a Certificate program from existing courses belonging to a previously approved baccalaureate/associate degree program, enter information about that program in the "Original Program" section.

Comments:

Conditions for Approval (if any)

SECTION 1: GENERAL INFORMATION (continued)

If program modification is concurrent with discontinuation of related program(s), please list for such program(s): Program Discontinued: Data Mining O.C.P CIP: 270301 OHE#: 009289 Accreditation Date: 2001 Phase Out Period **2019-2020** Date of Program Termination **Summer**, **2020**

Institution's Unit (e.g. School of Business) and Location (e.g. main campus) Offering the Program: Engineering, Science, and Technology

Other Program Accreditation:

- If seeking specialized/professional/other accreditation, name of agency and intended year of review:
- If program prepares graduates eligibility to state/professional license, please identify:

(As applicable, the documentation in this request should addresses the standards of the identified accrediting body or licensing agency)

Institutional Contact for this Proposal: Daniel Larose, PhD Title: Professor Tel.: 860-832-2862 e- mail: Iarosed@ccsu.edu

SECTION 2: BACKGROUND, RATIONALE AND NATURE OF MODIFICATION (Please Complete Sections as Applicable)

Background and Rationale (Please provide the context for and need for the proposed modification, and the relationship to the originally approved program)

As applicable, please describe:

• How does the program address CT workforce needs and/or the wellbeing of CT society/communities? (Succinctly present as much factual evidence and evaluation of stated needs as possible.)

The OCP in Data Science is embedded within the MS in Data Science. As such, the rationale behind the OCP program is the same as that of the MS program. The OCP offers a flexible credential for students who complete approximately 60% of the Master program requirements.

In 2018, Bloomberg called data scientist "the hottest job in America." Business Insider called it "The best job in America right now".. Glassdoor.com rated it the best job in the world in 2018 for the third year in a row. The Harvard Business Review called data scientist "The sexiest job in the 21st century."

LinkedIn's August 2018 Workforce Report found that there is a severe shortage of qualified data scientists, with America short 151,171 people with data science skills overall. "The need is particularly acute in New York City (short 34,032 people with data science skills)." The January 2019 report from Indeed.com, a leading jobs website, showed a 29% increase in demand for data scientists year-over-year, and a 344% increase since 2013.

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• How does the program make use of the strengths of the institution (e.g. curriculum, faculty, resources) and of its distinctive character and/or location?

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• Please describe any transfer agreements with CSCU institutions that will become instituted as a result of the approval of this program. (Please highlight details in the Quality Assessment portion of this application, as appropriate.)

n/a

 Please indicate what similar programs exist in other institutions within the CSCU System, and how unnecessary duplication is being avoided.

As mentioned earlier, CCSU was the first university in the world to offer a completely online Master of Science degree in data mining. Essentially, we have been doing data science since 2001. But back then, the term "data science" had not been invented yet. Today, the term "data mining" has evolved into something rather pejorative, similar to "data dredging" or 'fishing", which involves looking for (largely) spurious results in datasets to confirm a post hoc prediction. Thus, the name change.

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• Please provide a description/analysis of employment prospects for graduates of this proposed program.

To reiterate some of the rationale: Data scientists are in demand in Connecticut. There are between 1,700 and 3,000 data science jobs within 100 miles of Hartford, CT. Monster.com found over 3,000 data scientist jobs within 100 miles of Hartford. Most salary estimates were six figures. Data scientists specializing in bioinformatics are sought after by Pfizer, Yale New Haven Hospital, Techne Life Science, UConn Health Center, and the Jackson Laboratory Cancer Center. Scientists in text analytics appeal to business such as Travelers, Gartner, and Priceline.com. Scientists completing the clustering track would appeal to ESPN, Gartner, and Cigna. Scientists with computational specialization are sought after by The Hartford, Federal Bureau of Investigation (New Haven office), Unilever, and Pratt & Whitney.

Description of Modification (Please provide a summary of the modifications to curriculum, admissions or graduation requirements, mode of delivery, etc., and concisely describe how the institution will support these changes.

Admission requirements have changed in one way – reducing the number of recommendation letters to one rather than two. Note that the O.C.P is still entirely online. The rest of the changes have been made to the curriculum as detailed below.

The existing program has three required core courses (four credits each) and two electives courses (which ranges from six to eight credits) for a total of 18-20 credits. The new data science O.C.P. still has three required core courses, but now 8 - 10 credits of electives are needed, which makes a total of 20 - 22 credits.

Finally, although the data science O.C.P. is adding new electives, these can be handled by existing faculty. First, the computer science track consists of classes that currently run in their department, so there is no additional teaching load. Second, although the three specialized tracks add new classes, existing faculty can cover these at current student levels because we will change from scheduling all the same classes every year to scheduling some classes odd years and others even years. (We do not expect this to delay student graduation, as most students attend part time, and the Program Advisor may substitute courses for students on a deadline.) Third, currently our classes are typically run between 50% and 100% capacity, so we can handle a growing population of students for several years with existing faculty. Fourth, even large numbers of new students could be handled by hiring one or more adjuncts to teach current faculty's introductory-level statistics courses. Details on this are given in Section 3 of this form.

Description of Resources Needed (As appropriate please summarize faculty and administrative resources, library holdings, specialized equipment, etc. Details to be provided in the next section, as appropriate)

Given that we are modifying an existing online OCP, the only concern is covering the new elective classes. However, instead of offering the same courses every year as currently done, we have developed a two-year cycling of classes, which allows the current faculty to teach the larger number of classes. We will need to hire one adjunct instructor to teach introductory-level statistics course, as reflected in our budget below.

All program courses are taught by full-time faculty. No new library resources will be required beyond what we can obtain through the Department of Mathematical Sciences, as has been the case since 2001. No new computing equipment or software is required, nor is any software licensing. The faculty coordinator reviews applications and fields inquiries about the program. We have had a Graduate Assistant every semester since 2001, who helps the students navigate the steep learning curve with the new data science software.

To initiate and sustain this growth, we need to devote resources to *marketing*. Until now, there has been no advertising or marketing of our data mining programs. Marketing plans include:

- Partnering with the American Statistical Association to sponsor an annual Data-thon, where teams would compete to solve a business problem using analytics.
- Getting the word out that the textbooks written by our faculty, including *Data Mining and Predictive Analytics* (Larose and Larose, Wiley, 2015) have been adopted by data science programs, worldwide.

Other Considerations

The OCP in Data Science is fully embedded in the MS in Data Science.

Previous Three Years Enrollment and Completion for the Program being Modified

ACTUAL Enrollment	Fall Te	erm, 2018 Fall 7		Fall Term, Year 2017		Fall Term, Year 2016	
	Full Time	Part Time	Full Time	Part Time	Full Time	Part Time	
Transfers In	0	0	0	0	0	0	

New Students	0	0	0	2	0	2
Returning Students	0	0	0	1	1	1
ACTUAL Headcount	0	0	0	3	1	3
Enrollment						
Fall FTE accounted for by	0.0		0.9		1.0	
Program Majors*						
Size of Credentialed Group(s)		3		Λ	1	
for Given Year		5		4	I.	

*FTE is considered 12 credits for graduate students. Part-time students are calculated at 1/3 FTE.

Curriculum Details for a Pro	ogram M	Nodification	(to be used	d as appropriate for specific modification reques	t)2	
Course Number and Name ³	L.O. #	Pre- Requisite	Cr Hrs	Course Number and Name	L.O. #	Cr Hrs
Program Core Courses				Electives, continued		
Core: DATA 511, Introduction Data Science		none	4	Elective: DATA 531, Text Analytics with Information Retrieval		4
Core: DATA 512, Predictive Analytics, Estimation and Clustering		DATA 511	4	Elective: DATA 532, Text Analytics with Natural Language Programming		4
Core: DATA 513, Predictive Analytics, Classification		DATA 511	4	Elective: DATA 541, Advanced Estimation Methods		4
Elective: DATA 514, Multivariate Analytics		DATA 511	4	Elective: DATA 542, Advanced Clustering Methods		4
Elective: DATA 521, Introduction Bioinformatics			4	Elective: DATA 543, Advanced Classification Methods		4
Elective: DATA 522, Mining Gene and Protein Expression Data			4			
Elective: DATA 525, Biomarker Discovery			4			
Electives, continued				Elective Courses in the Field		
Elective: CS 508, Distributed Computing			3			
Elective: CS 570, Topics in Artificial Intellig	ence		3			
Elective: CS 580, Topics in Database Syste Applications	ems and	ł	3			
Elective: CS 563 or CS 525, Algorithms			3			
Total Other Credits Required to Issue Modif	ied Cred	lential				

² Details of course changes for Community College institutions should be provided with enough detail to introduce necessary changes in the centralized programmatic database for that system.

³ Make any detailed annotations for individual courses as needed to understand the curricular modifications taking place
Learning Outcomes - L.O. (Please list up to seven of the most important student learning outcomes for the program, and any changes introduced)

- 1. Approach data science using a scientific approach via a systematic process that avoids expensive mistakes by assessing and accounting for the true costs of making various errors.
- 2. Apply data science using a systematic process by implementing an adaptive and iterative framework that includes the following phases: research understanding, data understanding, data exploration, data modeling, evaluation, and deployment.
- 3. Demonstrate proficiency with leading open-source analytics software such as R and Python, as well as commercial platforms such as IBM/SPSS Modeler.
- 4. Understand and apply a wide range of clustering, estimation, prediction, and classification algorithms.
- 5. Demonstrate specialized skills in bioinformatics, text analytics, advanced methods, and/or algorithms.

SECTION 3: RESOURCE AND FINANCIAL CONSIDERATIONS

Two-Year Cost Effectiveness and Availability of Adequate Resources

(Please complete the Pro-Forma Budget – Projected Revenues and Expenditures on the following page. Provide any necessary annotations for the Pro-Forma Budget and other commentary regarding the cost effectiveness and availability of adequate resources for the proposed modification below:

Instead of offering the same courses every year, which is done for the data mining O.C.P/M.S., we have developed a two-year cycling of classes, which allows the current faculty to teach the larger number of classes. We do not expect this to delay student graduation, as most students are part time, and the Program Advisor may substitute courses for students on a deadline.

Core Courses for existing Data Mining M.S.		Cycling	
STAT 520	Fall		All
STAT 521	Fall	Spring	All
STAT 522		Spring	All
STAT 523	Fall		All
STAT 526	Fall		All
STAT 527		Spring	All

Electives		
STAT 525	Spring	All
STAT 529	Irregular	

The existing data mining O.C.P/M.S. requires the faculty to teach a little more than 8 courses per academic year. The "little more than" is due to STAT 529, which is a topics course that has been used to test some of the new courses developed for the data science program. Here is the new course cycling.

Core Courses for proposed Data Science O.C.P.		Cycling	
DATA 511 Introduction to Data Science.	Fall	Spring	All
DATA 512 Predictive analytics: Estimation and Clustering.		Spring	All
DATA 513 Predictive analytics: Classification	Fall		All
The following M.S. core class is an O.C.P. elective			

CONNECTICUT BOARD OF REGENTS FOR HIGHER EDUCATION Connecticut State Colleges & Universities

APPLICATION FOR MODIFICATION OF ACCREDITED PROGRAM						
DATA 514 Multivariate Analytics.	Fall		All			
Bioinformatics Track Electives						
DATA 521 Introduction to Bioinformatics	Fall		Odd			
DATA 522 Mining Gene and Protein Expression Data.		Spring	Odd			
DATA 525 Biomarker Discovery.	Fall		Even			
Text Analytics Track Electives						
DATA 531 Text Analytics with Information Retrieval.		Spring	Odd			
DATA 532 Text Analytics with Natural Language Processing.		Spring	Even			
Non-core 500-level DATA course						
Advanced Methods Track Electives						
DATA 541 Advanced Estimation Methods.	Fall		Odd			
DATA 542 Advanced Clustering Methods.	Fall		Even			
DATA 543 Advanced Classification Methods		Spring	Even			
Computational Track Electives						
CS 463 Algorithms		Spring				
CS 508 Distributed Computing		Spring				
CS 525 Advanced Algorithms	Fall					
CS 570 Topics in Artificial Intelligence		Spring				
CS 580 Topics in Database Systems and Applications	Fall					

¹We expect enrollments to consist of primarily part-time students because our students are typically employed. We believe that tailoring our program to address the need for training in specialized applications of data science (i.e., the four proposed tracks) will increase enrollment by 33% per year from 2016 levels for the next three years, resulting in total enrollments of 4, 5, and 6 part-time students each year. As this is a fully embedded OCP within the Data Science Master's program, actual enrollments are difficult to track; some students enrolled in the Master's-level program may decide that an OCP better suits their needs.

²Tuition reflects 2018-19 current per credit costs; it does not include any other general, online or university fees nor assumes tuition increases for 2019-22. Tuition in this program is \$683 per credit regardless of part-time or full-time status. Part-time students are estimated to take 5 credits per semester.

³Other revenue reflects the \$50 per course fee for online courses. The expected seat count across all online Data Science courses is estimated conservatively at 5, 7, and 9 seats for the next 3 years.

⁴These program expenditures are the same for the MS in Data Science.

⁵A faculty member receives 3 credits of reassignment per semester to administer the Data Science program, which includes the Master's and the OCP. The cost reflects 12.5% of the faculty member's base salary plus 48% in estimated fringe. Further, the increase across 3 years reflects the 3.7% contractual increase in salary through AY2020 as reflected in Articles 12.3 and 12.4 of the AAUP Contract.

⁶Currently, full-time faculty teach 30 credits per academic year within the Data Science program (both Master's and OCP). Across the next 3 years, we expect the number of credits offered by full-time faculty to increase to 24 in FY19, 27 in FY20, and 34 in FY21. We assume half of these credits to be offered each Fall. We scaled the salary of each faculty member teaching in the program to the number of credits they teach across the academic year and divided by 2 to obtain the Fall semester cost. In Fall 2018, 78 student credit hours were generated by students enrolled in the program (MS and OCP). However, the faculty taught 128 total student credit hours in program courses. Thus, the true cost of faculty teaching within the program was scaled to the student credit hours expected for program candidates as a function of total student credit hours expected. The scaling rates projected for the next 3 years based on enrollment increases within the total program (MS and OCP) are .65, .68, and

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APPLICATION FOR MODIFICATION OF ACCREDITED PROGRAM

.71, respectively. We should also note that the proportion of program student credit hours for computer science courses will be far below these scaling rates. As such, the estimates for faculty cost are likely overestimates. We estimated fringe at 48%. The increase across years represents a 3.7% change in salary through AY2020 as reflected in Articles 12.3 and 12.4 of the AAUP Contract. (Note: Faculty members teaching within the program and/or their ranks may change within 3 years.)

⁷We assume one additional undergraduate section taught each year by an adjunct at the Level C rate. Fringe benefits are estimated at 31%. Rates and increases reflect Article 12.7.6 of the CSU-AAUP contract.

⁸The cost of a GA is \$5400 per year, or \$2700 per semester. We also estimate \$1000 per semester in marketing costs. These costs are shared with the MS in Data Science.

⁹The expense of the Data Science program incorporates both the OCP and MS. To scale the true expense of the OCP, we took the total revenue of the Data Science program and calculated the proportion of revenue attributable to the OCP and then applied the same scaling factor to the expenses.

PROJECTED Program Revenue ¹	Spring 2020	Spring 2021	Spring 2022
Tuition (do not include internal transfers) ²	\$ 13,660	\$ 17,075	\$ 20,490
Program-Specific Fees	\$ -	\$ -	\$-
Other Revenue (Online course fees) ³	\$ 250	\$ 350	\$ 450
Total Estimated Program Revenue	\$ 13,910	\$ 17,425	\$ 20,940

PRO FORMA Budget - Projected Revenues and Expenditures (Whole Dollars Only)

PROJECTED Program Expenditures*4	Spring 2020	Spring 2021	Spring 2022
Administration (Chair or Coordinator) ⁵	\$ 21,136	\$ 21,918	\$ 21,918
Faculty (Full-time, total for program) ⁶	\$ 52,741	\$ 65,132	\$ 81,883
Faculty (Part-time, total for program) ⁷	\$ 6,830	\$ 7,204	\$ 7,204
Support Staff	n/a	n/a	n/a
Library Resources Program	n/a	n/a	n/a
Equipment (List as needed)	n/a	n/a	n/a
Other (e.g. student services) GA ⁸	\$ 3,700	\$ 3,700	\$ 3,700
Estimated Indirect Costs (e.g. student services, operations, maintenance)	n/a	n/a	n/a
Total Estimated Program Expenditures	\$ 84,406	\$ 97,953	\$ 114,704

*Note: Capital outlay costs, institutional spending for research and services, etc. can be excluded.

	Spring 2020	Spring 2021	Spring 2022
Total Program Revenue [OCP+MS] ⁹	\$ 88,790	\$ 105,865	\$ 126,355
Proportion of Total Program Revenue from MS	0.154	0.161	0.161
Total Expenditures Assignable to MS	\$ 12,999	\$ 15,771	\$ 18,468

This PRO FORMA Budget provides reasonable assurance that the proposed program modification can be established and is sustainable. Some assumptions and/or formulaic methodology may be used and annotated in narrative on page 4 of Application.

CT BOARD OF REGENTS FOR HIGHER EDUCATION

RESOLUTION

concerning

Program Modification

September 19, 2019

RESOLVED: That the Board of Regents for Higher Education approve the modification of an online degree program – Masters of Business Administration (CIP Code: 52.0201, OHE # 19157) leading to a Masters degree, specially implementation of the program as previously approved (BR 17-089) without the partnering institution - from jointly conferred to singly conferred, at Southern Connecticut State University.

A True Copy:

Erin A. Fitzgerald, Secretary of the CT Board of Regents for Higher Education

ITEM

Implementation of the program – an online Masters of Business Administration - as previously approved without the partnering institution - from jointly conferred to singly conferred, at Southern Connecticut State University

BACKGROUND

<u>Summary</u>

In 2017, the Board of Regents and NECHE (then NEASC) approved the referenced program to be jointly delivered by Southern CT State University and Liverpool John Moores University.

Several factors at LJMU, including senior leadership changes and the impact of Brexit on enrollment, have limited LJMU's capacity to deliver this program jointly with SCSU at this time. However, this program remains vital to SCSU's strategic planning. While will continue to work with LJMU to make the jointly conferred degree a reality, SCSU needs the flexibility to also offer this degree program on its own.

Resources

The institution has restructured the program's budget for its initial three years which indicates its projected revenue will exceed projected expenditures by more than \$800,000.

RECOMMENDATION

The System's Provost and Senior Vice President for Academic and Students Affairs recommends that the Board of Regents approve this program modification.

09/06/2019 – BOR Academic & Student Affairs Committee 09/19/2019 – Board of Regents

SECTION 1: GENER	AL INFORMATION
Institution: Southern CT State University Date of	f Submission to CSCU Office of the Provost: Aug. 28, 2019
Most Recent NECHE Institutional Accreditation Action and Date	: 5th Year Interim Report accepted Feb. 2017
Original Program Characteristics CIP Code No. 52.0201 Title of CIP Code Business/Commerce, General. Name of Program: Business Administration Degree: Title of Award (<i>e.g. Master of Arts</i>) MBA Stand-Alone Certificate: (<i>specify type and level</i>) Date Program was Initiated: approved in 2017 but not yet implemented OHE#: 019157 Modality of Program: On ground X Online Combined If "Combined", % of fully online courses? Locality of Program: On Campus Off Campus Both	 Original Program Credit Distribution # Credits in General Education: # Credits in Program Core Courses: 33 # Credits of Electives in the Field: 9 # Credits of Free Electives: # Cr Special Requirements (include internship, etc.): 3 Total # Cr in the Program (sum of all #Cr above): 45 From "Total # Cr in the Program" above, enter #Cr that are part of/belong in an already approved program(s) at the institution: 45
Type of Program Modification Approval Being Sought (mark a OTHER—see Section 2, Background & Rationale Significant Modification of Courses/Course Substitutions* Offering of Program at Off-Campus Location (specify new locati Offering of Program Using an Alternate Modality (e.g. from on g Change of Degree Title or Program Title *Significant is defined as "more than 15 credits in a previously a credits in a previously approved graduate degree program.	all that apply): on) ground to online) approved undergraduate degree program or more than 12
Modified Program Characteristics NO CHANGES Name of Program: Degree: Title of Award (<i>e.g. Master of Arts</i>) Certificate ¹ : (<i>specify type and level</i>) Program Initiation Date: Modality of Program: On ground Online Combined If "Combined", % of fully online courses? Locality of Program: On Campus Off Campus Both	Modified Program Credit Distribution NO CHANGES # Credits in General Education: # Credits in Program Core Courses: # Credits of Electives in the Field: # Credits of Free Electives: # Cr Special Requirements (include internship, etc.): Total # Cr in the Program (sum of all #Cr above): From "Total # Cr in the Program" above, enter #Cr that are part of/belong in an already approved program(s) at the institution:
Total Number of courses and course credits to be modified by th	is application:
If program modification is concurrent with discontinuation of rela Program Discontinued: CIP: OHE#: Phase Out Period Date of Program Termination	ted program(s), list information for such program(s): Accreditation Date:
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Business is in the candidacy phase of the AACSB accreditation process; site visit is planned for Fall 2021.

¹ If creating a Stand-Alone Certificate program from existing courses belonging to a previously approved baccalaureate/associate degree program, enter information about that program in the "Original Program" section.

If program prepares graduates eligibility to state/professional license, please identify:

(As applicable, the documentation in this request should addresses the standards of the identified accrediting body or licensing agency)

Institutional Contact for this Proposal: Dr. Robert S. Prezant Title: Provost and VP for Academic AffairsTel.: 203 392 5350e- mail: prezantr1@southernct.eduInstitution's Unit (e.g. School of Business) and Location (e.g. main campus) Offering the Program:

School of Business, Main Campus

SECTION 2: BACKGROUND, RATIONALE AND NATURE OF MODIFICATION (Please Complete Sections as Applicable)

Background and Rationale (Please provide the context for and need for the proposed modification, and the relationship to the originally approved program)

In 2017, the CSCU BOR and NECHE (then NEASC) approved two degrees to be jointly delivered by Southern CT State University and Liverpool John Moores University—an existing online MBA and a new on-ground MS-Coastal Resilience.

Several factors at LJMU, including senior leadership changes and the impact of Brexit on enrollment, have limited LJMU's capacity to deliver these programs jointly with SCSU at this time. However, these programs remain vital to SCSU's strategic planning. While we will continue to work with LJMU to make the jointly conferred degrees a reality, SCSU needs the flexibility to also offer these degree programs on our own.

After consultation with NECHE about how SCSU could begin to offer the online MBA and on-ground MS-Coastal Resilience degree programs in fall 2020 without LJMU, President Bertolino has been asked to submit a brief written notification to the Commission for its November meeting explaining the circumstances that prompted us to rethink the delivery model from jointly to singly conferred degrees and to affirm SCSU's capacity to solely deliver the online MBA and on-ground MS-Coastal Resilience.

After a similar consultation with CSCU Provost Gates, SCSU submits this request for a modification of an accredited program: that the Board of Regents for Higher Education allow the previously approved program leading to a jointly conferred online Masters of Business Administration (MBA) degree to also be conferred solely by Southern Connecticut State University.

Please note that CT OHE added program 019157 when the CT BOR approved the jointly conferred online MBA:

Institution	OHE Number	Program Name	Delivery	Town	Award Level	Award	Program	Status	CIP Code
Southern Connecticut State Univer	sity002970	Business Administratio	onOnground I	New Haver	Master's Degree	MBA	Accredited	Program	520201
Southern Connecticut State Univer	sity019157	Business Administratio	onOnline I	New Haver	Master's Degree	MBA	Accredited	Program	1520201

Admission and graduation requirements and the curriculum for the online MBA remain the same as they were in the originally approved program. All courses for the program have been approved for delivery at SCSU by the SCSU School of Business Curriculum Committee, the SCSU Graduate Council, the SCSU Dean of the School of Business, and the SCSU Provost.

A modified budget follows, which uses CSCU approved AY 2019-20 FT MBA/AMBA tuition and fee rates to calculate program revenue and removes program expenses that were specific to the joint delivery of the program, such as the revenue share with LIMU.

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As applicable, please describe:

- How does the program address CT workforce needs and/or the wellbeing of CT society/communities? (Succinctly present as much factual evidence and evaluation of stated needs as possible)
- How does the program make use of the strengths of the institution (*e.g. curriculum, faculty, resources*) and of its distinctive character and/or location?
- Please describe any transfer agreements with CSCU institutions that will become instituted as a result of the approval of this program (*Please highlight details in the Quality Assessment portion of this application, as appropriate*)
- Please indicate what similar programs exist in other institutions within the CSCU System, and how unnecessary duplication is being avoided
- Please provide a description/analysis of employment prospects for graduates of this proposed program

Present side-by-side listing of curricular modification: (From Original to Modified)

Description of Related Modification (Provide a summary of other changes necessitated by curricular modification such as admissions or graduation requirements, mode of delivery etc., and concisely describe how the institution will support these changes.)

Admissions and graduation requirements and the curriculum for the online MBA remains the same as they were in the originally approved program. All courses for the program have been approved for delivery at SCSU by the SCSU School of Business Curriculum Committee, the SCSU Graduate Council, the SCSU Dean of the School of Business, and the SCSU Provost. All courses will now be delivered by SCSU.

Description of Resources Needed (As appropriate please summarize faculty and administrative resources, library holdings, specialized equipment, etc. Details to be provided in the next section, as appropriate)

Other Considerations

Previous Three Years Enrollment and Completion for the Program being Modified

ACTUAL Enrollment	Fall Term,	all Term, Year Fall Term, Year Fall Term, Year		Fall Term, Year		'ear
	Full Time	Part Time	Full Time	Part Time	Full Time	Part Time
Transfers In						
New Students						
Returning Students						
ACTUAL Headcount Enrollment						
Fall FTE accounted for by Program Majors						
Size of Credentialed Group(s) for Given Year						

Curriculum Details for a Program Modification (to be used as appropriate for specific modification request) ²						
Course Number and Name ³	L.O. #	Pre- Requisite	Cr Hrs	Course Number and Name	L.O. #	Cr Hrs
Program Core Courses				Other Related/Special Requirements		
Care Course Drozenuisites				Floative Courses in the Field		
Core Course Prerequisites				Elective Courses in the Field		
Total Other Credits Required to Issue Modified Credential						

Learning Outcomes - **L.O.** (*Please list up to seven of the most important student learning outcomes for the program, and any changes introduced*)

1.

2.

3.

4.

5.

6. 7.

7.

SECTION 3: RESOURCE AND FINANCIAL CONSIDERATIONS

Cost Effectiveness and Availability of Adequate Resources

(Please complete the Pro-Forma Budget – Projected Revenues and Expenditures on the following page. Provide any necessary annotations for the Pro-Forma Budget and other commentary regarding the cost effectiveness and availability of adequate resources for the proposed modification below:

A modified budget follows, which uses CSCU approved AY 2019-20 FT MBA/AMBA tuition and fee rates to calculate program revenue and removes program expenses that were specific to the joint delivery of the program, such as the revenue share with LIMU.

² Details of course changes for Community College institutions should be provided with enough detail to introduce necessary changes in the centralized programmatic database for that system.

³ Make any detailed annotations for individual courses as needed to understand the curricular modifications taking place

Budget assumptions:

- Program consists of 45 credits.
- Each Cohort will take 15 months to complete program.
- For purposes of this analysis, it is assumed that the first cohort will consist of 20 students, then 25, then remain at 30 in subsequent years. In-state tuition rates used.
- The analysis assumes that students will be charged \$23,765 for the program.
- Tuition and fees include books but not optional study abroad experience.
- The program has one optional faculty-led class abroad in Liverpool for an additional fee of \$3500 that is inclusive of airfare, room, and board. The course will also be offered online for non-opting students.
- Cohorts start every Fall. The first session will overlap with the final session of the previous cohort.
- Analysis DOES NOT reflect annual tuition increases, bargaining unit increases or inflationary adjustments

PRO FORMA Budget - Projected Revenues and Expenditures (Whole Dollars Only)

PROJECTED Program Revenue	Fall 2020	Fall 2021	Fall 2022
Tuition and fees (do not include internal			
transfers)	\$475,300	\$594,125	\$712,950
Program-Specific Fees			
Other Revenue (Annotate in narrative)			
Total Estimated Program Revenue	\$475,300	\$594,125	\$712,950

PROJECTED Program Expenditures*	Fall 2020	Fall 2021	Fall 2022
Administration (Chair or Coordinator)	N/A	N/A	N/A
Faculty (Full-time, total for program)	\$40,000	\$80,000	\$80,000
Faculty (Part-time, total for program)	\$30,750	\$30,750	\$30,750
Support Staff (UA)	\$25,000	\$25,000	\$25,000
Fringe Benefits @ 50%	\$62,875	\$67,875	\$67,875
Faculty Training Program and Instructional Design and Maintenance	\$55,000	\$6250	\$6250
Books (List as needed)	\$40,000	\$50,000	\$60,000
Other (e.g. marketing, assessment, accreditation, misc.)	\$26,000	\$38,750	\$43,000
Estimated Indirect Costs (e.g. student services, operations, maintenance)	\$27,900	\$29,999	\$32,136
Total Estimated Program Expenditures	\$307,525	\$328,624	\$345,011

*Note: Capital outlay costs, institutional spending for research and services, etc. can be excluded.

This PRO FORMA Budget provides reasonable assurance that the proposed program modification can be established and is sustainable. Some assumptions and/or formulaic methodology may be used and annotated in narrative on page 4 of Application.

CT BOARD OF REGENTS FOR HIGHER EDUCATION

RESOLUTION

concerning

Program Modification

October 24, 2019

RESOLVED: That the Board of Regents for Higher Education approve the modification of a degree program – Coastal Resilience (CIP Code: 03.0103, OHE # 19158) leading to a Master of Science degree, specially implementation of the program as previously approved (BR 17-090) without the partnering institution - from jointly conferred to singly conferred, at Southern Connecticut State University.

A True Copy:

Erin A. Fitzgerald, Secretary of the CT Board of Regents for Higher Education

ITEM

Implementation of the program – Coastal Resilience – as previously approved without the partnering institution - from jointly conferred to singly conferred, at Southern Connecticut State University

BACKGROUND

Summary

In 2017, the Board of Regents and NECHE (then NEASC) approved the referenced program to be jointly delivered by Southern CT State University and Liverpool John Moores University.

Several factors at LJMU, including senior leadership changes and the impact of Brexit on enrollment, have limited LJMU's capacity to deliver this program jointly with SCSU at this time. However, this program remains vital to SCSU's strategic planning. While SCSU will continue to work with LJMU to make the jointly conferred degree a reality, SCSU needs the flexibility to also offer this degree program on its own.

Resources

The institution has restructured the program's budget for its initial three years which indicates its projected revenue will exceed projected expenditures by more than \$570,000.

RECOMMENDATION

Following its review and deliberative process, it is the recommendation of the Academic Council that the Board of Regents approve this program modification. The System's Provost and Senior Vice President for Academic and Students Affairs concurs with this recommendation.

10/11/2019 – BOR Academic & Student Affairs Committee 10/24/2019 – Board of Regents

SECTION 1: GENER	AL INFORMATION				
Institution: Southern CT State University Date of	f Submission to CSCU Office of the Provost: Aug. 28, 2019				
Most Recent NECHE Institutional Accreditation Action and Date	5th Year Interim Report accepted Feb. 2017				
Original Program Characteristics CIP Code No. 03.0103 Title of CIP Code Environmental Studies Name of Program: Coastal Resilience Degree: Title of Award (e.g. Master of Arts) Master of Science Stand-Alone Certificate: (specify type and level) Date Program was Initiated: approved in 2017 but not yet implemented OHE#: 019158 Modality of Program: X On ground Online Combined If "Combined", % of fully online courses? Locality of Program: On Campus Off Campus X Both	 Original Program Credit Distribution # Credits in General Education: # Credits in Program Core Courses: 42 # Credits of Electives in the Field: # Credits of Free Electives: # Cr Special Requirements (include internship, etc.): 3 Total # Cr in the Program (sum of all #Cr above): From "Total # Cr in the Program" above, enter #Cr that are part of/belong in an already approved program(s) at the institution: 45 				
Type of Program Modification Approval Being Sought (mark all that apply): OTHER—see Section 2, Background & Rationale Significant Modification of Courses/Course Substitutions* Offering of Program at Off-Campus Location (specify new location) Offering of Program Using an Alternate Modality (e.g. from on ground to online) Change of Degree Title or Program Title *Significant is defined as "more than 15 credits in a previously approved undergraduate degree program or more than 12					
 Modified Program Characteristics NO CHANGES Name of Program: Degree: Title of Award (<i>e.g. Master of Arts</i>) Certificate¹: (specify type and level) Program Initiation Date: Modality of Program: On ground Online Combined If "Combined", % of fully online courses? Locality of Program: On Campus Off Campus Both 					
Total Number of courses and course credits to be modified by the	is application:				
If program modification is concurrent with discontinuation of relationProgram Discontinued:CIP:OHE#:Phase Out PeriodDate of Program Termination	If program modification is concurrent with discontinuation of related program(s), list information for such program(s): Program Discontinued: CIP: OHE#: Accreditation Date: Phase Out Period Date of Program Termination				
 Other Program Accreditation: If seeking specialized/professional/other accreditation, name of agency and intended year of review: If program prepares graduates eligibility to state/professional license, please identify: 					

¹ If creating a Stand-Alone Certificate program from existing courses belonging to a previously approved baccalaureate/associate degree program, enter information about that program in the "Original Program" section.

(As applicable, the documentation in this request should addresses the standards of the identified accrediting body or licensing agency)

Institutional Contact for this Proposal: Dr. Robert S. Prezant Title: Provost and VP for Academic AffairsTel.: 203 392 5350e- mail: prezantr1@southernct.edu

Institution's Unit (*e.g. School of Business*) and Location (*e.g. main campus*) Offering the Program: School of Arts and Sciences, Main Campus

SECTION 2: BACKGROUND, RATIONALE AND NATURE OF MODIFICATION

(Please Complete Sections as Applicable)

Background and Rationale (Please provide the context for and need for the proposed modification, and the relationship to the originally approved program)

In 2017, the CSCU BOR and NECHE (then NEASC) approved two degrees to be jointly delivered by Southern CT State University and Liverpool John Moores University—an existing online MBA and a new on-ground MS-Coastal Resilience.

Several factors at LJMU, including senior leadership changes and the impact of Brexit on enrollment, have limited LJMU's capacity to deliver these programs jointly with SCSU at this time. However, these programs remain vital to SCSU's strategic planning. While we will continue to work with LJMU to make the jointly conferred degrees a reality, SCSU needs the flexibility to also offer these degree programs on our own.

After consultation with NECHE about how SCSU could begin to offer the online MBA and on-ground MS-Coastal Resilience degree programs in fall 2020 without LJMU, President Bertolino has been asked to submit a brief written notification to the Commission for its November meeting explaining the circumstances that prompted us to rethink the delivery model from jointly to singly conferred degrees and to affirm SCSU's capacity to solely deliver the online MBA and on-ground MS-Coastal Resilience.

After a similar consultation with CSCU Provost Gates, SCSU submits this request for a modification of an accredited program: that the Board of Regents for Higher Education allow the previously approved program leading to a jointly conferred MS-Coastal Resilience degree to also be conferred solely by Southern Connecticut State University.

Please note that CT OHE added programs 019158 and 019512 when the CT BOR approved the jointly conferred MS-Coastal Resilience:

Institution	OHE Numbe	Program Name Delive	ery Town	Award Level	Award Program Status CIP Cod	le
Southern Connecticut State Univer	rsity019158	Coastal Resilience Ongrou	und New Have	nMaster's Degree	eMS Accredited Program030103	
Southern Connecticut State Univer	rsity019512	SCSU/Liverpool (England) John Moores University Joint MS in Coastal ResilienceHybrid	New Have	nMaster's Degree	eMS Accredited Program030103	

Admissions and graduation requirements and the curriculum for the MS-Coastal Resilience remains the same as it was in the originally approved program. All courses for the program have been approved for delivery at SCSU by the SCSU Department of Environmental Studies, Geography, & Marine Studies, the SCSU Graduate Council, the SCSU Dean of the School of Arts & Sciences, and the SCSU Provost.

A modified budget follows, which uses CSCU approved AY 2019-20 regular FT tuition and fee rates to calculate program revenue and removes program expenses that were specific to the joint delivery of the program, such as the revenue share with LIMU.

As applicable, please describe:

- How does the program address CT workforce needs and/or the wellbeing of CT society/communities? (Succinctly present as much factual evidence and evaluation of stated needs as possible)
- How does the program make use of the strengths of the institution (*e.g. curriculum, faculty, resources*) and of its distinctive character and/or location?
- Please describe any transfer agreements with CSCU institutions that will become instituted as a result of the approval of this program (*Please highlight details in the Quality Assessment portion of this application, as appropriate*)
- Please indicate what similar programs exist in other institutions within the CSCU System, and how unnecessary duplication is being avoided
- Please provide a description/analysis of employment prospects for graduates of this proposed program

Present side-by-side listing of curricular modification: (From Original to Modified)

Description of Related Modification (Provide a summary of other changes necessitated by curricular modification such as admissions or graduation requirements, mode of delivery etc., and concisely describe how the institution will support these changes.)

Admissions and graduation requirements and the curriculum for the MS-Coastal Resilience remains the same as it was in the originally approved program. All courses for the program have been approved for delivery at SCSU by the SCSU Department of Environmental Studies, Geography, & Marine Studies, the SCSU Graduate Council, the SCSU Dean of the School of Arts & Sciences, and the SCSU Provost. All courses will now be delivered by SCSU.

Description of Resources Needed (As appropriate please summarize faculty and administrative resources, library holdings, specialized equipment, etc. Details to be provided in the next section, as appropriate)

Other Considerations

Previous Three Years Enrollment and Completion for the Program being Modified

ACTUAL Enrollment	Fall Term, Year		Fall Term, Year		Fall Term, Year		
	Full Time	Part Time	Full Time	Part Time	Full Time	Part Time	
Transfers In							
New Students							
Returning Students							
ACTUAL Headcount Enrollment							
Fall FTE accounted for by Program Majors							
Size of Credentialed Group(s) for Given Year							

Curriculum Details for a Pro	Curriculum Details for a Program Modification (to be used as appropriate for specific modification request) ²						
Course Number and Name ³	L.O. #	Pre- Requisite	Cr Hrs	Course Number and Name	L.O. #	Cr Hrs	
Program Core Courses				Other Related/Special Requirements			
Core Course Prerequisites				Elective Courses in the Field			
Total Other Credits Required to Issue Modif	ied Cred	lential					
Learning Outcomes - L.O. (Please list up introduced)	to seven	of the most in	nportant st	udent learning outcomes for the program, a	and any c	hanges	
1.							
2.							
3.							
4.							
5.							
6.							
7.							

SECTION 3: RESOURCE AND FINANCIAL CONSIDERATIONS

Cost Effectiveness and Availability of Adequate Resources

(*Please complete the Pro-Forma Budget – Projected Revenues and Expenditures on the following page.* Provide any necessary annotations for the Pro-Forma Budget and other commentary regarding the cost effectiveness and availability of adequate resources for the proposed modification below:

A modified budget follows, which uses CSCU approved AY 2019-20 regular FT tuition and fee rates to calculate program revenue and removes program expenses that were specific to the joint delivery of the program, such

² Details of course changes for Community College institutions should be provided with enough detail to introduce necessary changes in the centralized programmatic database for that system.

³ Make any detailed annotations for individual courses as needed to understand the curricular modifications taking place

as the revenue share with LJMU.

Budget assumptions:

- Program consists of 45 credits 27 credits (on ground) classroom instruction, 3 credits study abroad experience, and 15 credits of supervised research (on ground or on line).
- Each Cohort will take 12 months to complete program.
- Cohorts start every Fall.
- For purposes of this analysis, it is assumed that the first cohort will consist of 12 students, then 16, then 18. Instate tuition rates used.
- AY 2019-20 Tuition and Fee Rate Schedule used. Program fee of \$22,616 includes \$3,500 for the Wintersession Study Abroad component.
- Tuition and Fees does not include room and board with the exception of the Wintersession Study Abroad component. The \$3,500 Study Abroad Fee covers travel expenses, and room & board for the Wintersession field school experience.
- Analysis DOES NOT reflect annual tuition increases, bargaining unit increases or inflationary expense adjustments.

PROJECTED Program Revenue	Fall 2020	Fall 2021	Fall 2022
Tuition (do not include internal transfers)	\$271,392	\$361,856	\$407,088
Program-Specific Fees			
Other Revenue (Annotate in narrative)			
Total Estimated Program Revenue	\$271,392	\$361,856	\$407,088

PRO FORMA Budget - Projected Revenues and Expenditures (Whole Dollars Only)

PROJECTED Program Expenditures*	Fall 2020	Fall 2021	Fall 2022
Administration (Chair or Coordinator)	\$10,950	\$11,556	\$11,556
Faculty (Full-time, total for program)	N/A	N/A	N/A
Faculty (Part-time, total for program)	\$24,375	\$35,625	\$39,375
Fringe Benefits @ 50%	\$17,663	\$23,591	\$25,466
Study Abroad Wintersession Field School			
expenses @ \$3500/student	\$42,000	\$56,000	\$63,000
Equipment and Repairs (List as needed)	\$10,000	\$10,000	\$10,000
Other (e.g. marketing)	\$8,000	\$8,000	\$8,000
Estimated Indirect Costs (e.g. student services,			
operations, maintenance)	\$14,299	\$18,177	\$19,790
Total Estimated Program Expenditures	\$127,287	\$162,949	\$177,187

*Note: Capital outlay costs, institutional spending for research and services, etc. can be excluded.

This PRO FORMA Budget provides reasonable assurance that the proposed program modification can be established and is sustainable. Some assumptions and/or formulaic methodology may be used and annotated in narrative on page 4 of Application.



NEW ENGLAND ASSOCIATION OF SCHOOLS & COLLEGES, INC. COMMISSION ON INSTITUTIONS OF HIGHER EDUCATION

DAVID P. ANGEL, Chair (2018) Clark University DAVID QUIGLEY, Vice Chair (2018) Boston College G. TIMOTHY BOWMAN (2018) Harvard University THOMAS L. G. DWYER (2018) Johnson & Wales University JOHN F. GABRANSKI (2018) Haydenville, MA KAREN L. MUNCASTER (2018) Brandels University CHRISTINE ORTIZ (2018) Massachusetts Institute of Technology JON S. OXMAN (2018) Audurn, Me ROBERT L. PURA (2018) Greenfield Community College ABDALLAH A. SFEIR (2018) Lebanese American University REV. BRIAN J. SHANLEY, O.P. (2018) Providence College HARRY E. DUMAY (2019) College of Our Lady of the Elms JEFFREY R. GODLEY (2019) Groton, CT COLEEN C. PANIALONE (2019) Northeastern University MARIKO SILVER (2019) Bennington College GEORGE W. TETLER (2019) Worcester, MA KASSANDRA S. ARDINGER (2020) Justee Member, Concord, NH RUSSELL CAREY (2020) Brown University FRANCESCO C. CESAREO (2020) Assumption College RICK DANIELS (2020) Cohosset, MA DONALD H. DEHAYES (2020) PAM Y. EDDINGER (2020) Bunker Hill Community College THOMAS S. EDWARDS (2020) Thomas College KIMBERLY M. GOFF-CREWS (2020) Yole University THOMAS C. GREENE (2020) Vermont College of Fine Arts MARRIN J. HOWARD (2020) Boston University SUSAN D. HUARD (2020) Manchester Community College (NH) PETER J, LANGER (2020) University of Massachusetts Boston JEFFREY S. SOLOMON (2020) Worcester Polytechnic Institute President of the Commission BARBARA E. BRITTINGHAM bbrittingham@neasc.org Senior Vice President of the Commission PATRICIA M. O'BRIEN, SND pobrien@neasc.org Vice President of the Commission CAROL L. ANDERSON canderson@neasc.org Vice President of the Commission PAULA A. HARBECKE pharbecke@neasc.org Vice President of the Commission TALA KHUDAIRI tkhudalri@neasc.org

October 31, 2017

Dr. Joseph Bertolino President Southern Connecticut State University 501 Crescent Street New Haven, CT 06515-0901

Dear President Bertolino:

I am pleased to inform you that at its meeting on September 29, 2017, the Commission on Institutions of Higher Education considered the report submitted by Southern Connecticut State University and took the following action:

that the report regarding the University's plans to offer two joint degree programs, a Master of Business Administration (MBA) and an MS in Coastal Resilience, with Liverpool John Moores University be accepted and the joint degree programs be encompassed within the institution's accreditation, with an effective date of September 29, 2017;

that a visit to assess implementation of the joint MBA and MS in Coastal Resilience degree programs be scheduled for Fall 2019;

that the report prepared in advance of the Fall 2019 site visit give emphasis to the institution's success in:

- ensuring that the University's transfer of credit policies related to the joint MBA and MS in Coastal Resilience degree programs are consistent with Commission policies and the *Standards for Accreditation*;
- achieving the enrollment goals set for the joint MBA and the MS in Coastal Resilience degree programs and maintaining sufficient financial resources to sustain academic quality;
- 3. clarifying the role of faculty in the development of course content and curriculum in the programs;
- 4. ensuring that academic and student support services, including advising, are sufficient to support the programs;
- 5. developing policies and procedures for the systematic review of the MS in Coastal Resilience joint degree program.

3 BURLINGTON WOODS DRIVE, SUITE 100, BURLINGTON, MA 01803-4514 | TOLL FREE 1-855-886-3272 | TEL: 781-425-7785 | FAX: 781-425-1001 https://clhe.neasc.org Dr. Joseph Bertolino October 31, 2017 Page 2

The Commission gives the following reasons for its action.

The report submitted by Southern Connecticut State University (SCSU) was accepted and the joint MBA and MS in Coastal Resilience degree programs offered with Liverpool John Moores University (LJMU) encompassed within the institution's accreditation because the Commission finds the activity to be substantially in compliance with the *Standards for Accreditation* and relevant Commission policies.

The Commission commends Southern Connecticut State University for submitting a cogent and well-conceived report outlining its plans to offer two cohort-model joint degree programs in collaboration with LJMU. The first program, a 15-month, 45-credit low-residency MBA degree program, comprises the same curriculum and admissions process as the institution's existing traditional and accelerated MBA programs. We note with approval that the MBA program director at SCSU and a faculty member at the LJMU Business School will oversee the program, and SCSU and LJMU faculty assigned to teach in the program are appropriately qualified and sufficient in number. In addition, we view positively SCSU's commitment to provide MBA faculty with pedagogical training and technological support for online teaching. We further note with favor that SCSU will hire two additional full-time faculty members to deliver its portion of the program. The second joint degree program, a one-year, 45-credit MS in Coastal Resilience offered in an on-ground format, is new, and we appreciate learning of the comprehensive research and planning that went into the development of this multidisciplinary program that will focus on "a holistic consideration of coastal resilience in the face of considerable environmental change and challenge." The report assures that department chairs from SCSU and LJMU will oversee program implementation, and there are a sufficient number of qualified faculty from disciplines including Environmental, Geography, and Marine Studies and Geography and Environmental Science to support the program. The report further documents the student services, including advising, that will support each program, and we note with approval that a part-time external examiner will be employed to verify the academic quality of the joint MBA and MS in Coastal Resilience programs.

In keeping with Commission policy, an on-site evaluation to assess implementation of the MBA and MS in Coastal Resilience joint degree programs will be scheduled for Fall 2019. A copy of the relevant procedural statement is enclosed for your information and use.

In the report prepared in advance of the Fall 2019 site visit, the institution is asked to give emphasis to five matters related to our standards on *The Academic Program, Students, Institutional Resources,* and *Organization and Governance.*

According to the report, the QAA standards allow an institution to accept transfer credits for up to two-thirds of a master's degree program. The Commission's standards, however, state that "[a]t the graduate level, the institution accepts credit in transfer on a strictly limited basis to preserve the integrity of the degree awarded" (4.41). As documented in the report, LJMU is confident that it can "work within SCSU parameters [and] amend the framework" to ensure this requirement is met. We understand that SCSU and LJMU plan to meet sometime between November 2017 and February 2018 to address this matter. The report prepared in advance of the Fall 2019 site visit will afford SCSU an opportunity to provide evidence that its transfer of credit policies related to the joint MBA and MS in Coastal Resilience degree programs are consistent with Commission policies and our standard on *The Academic Program* (cited above and below):

Credit awards are consistent with Commission policy and the course content, appropriate to the field of study, and reflect the level and amount of student learning. The award of credit is based on policies developed and overseen by the faculty and academic administration. There is demonstrable academic content for all experiences for which credit is awarded, including study abroad, internships, independent study, and service Dr. Joseph Bertolino October 31, 2017 Page 3

learning. No credit toward graduation is awarded for pre-collegiate-level or remedial work designed to prepare the student for collegiate study (4.34).

We note that revenue and administrative costs and responsibilities will be split 65% (SCSU)/35% (LJMU), and the cohort model of enrollment will be implemented, in part, because of the benefits that include "administrative and pedagogical efficiencies in scheduling [and] predictable enrollment numbers." According to the pro forma budgets included in the report, 20 full-time students are projected to enroll in the joint MBA program in FY2019, generating revenue of \$500,000, increasing to 30 full-time students and revenue of \$720,000 in Fall 2021; 15 full-time students are projected to enroll in the joint MS in Coastal Resilience program in FY2019, generating revenue of \$325,000, increasing to 20 full-time students and revenue of \$430,000 in Fall 2021. We look forward, in the Fall 2019 report, to learning of the institution's progress in achieving these enrollment and revenue goals and maintaining sufficient financial resources to sustain academic quality and support the MBA and the MS in Coastal Resilience joint degree programs as evidence that "the institution sets and achieves realistic goals to enroll students who are broadly representative of the population the institution wishes to serve" (Students, Statement of Standard), and that "[t]he institution's multi-year financial planning is realistic and reflects the capacity of the institution to depend on identified sources of revenue and ensure the advancement of educational quality and services for students" (7.6).

We further understand that the proposed joint programs will be delivered by UK- and US-based faculty. We note positively that "coastal resilience is an area of curricular strength and wellestablished faculty partnerships at both institutions," and we appreciate learning that, since implementing the initial Memorandum of Understanding in 2015, SCSU and LJMU faculty have collaborated on joint teaching and/or research projects in nearly a dozen disciplines. In addition, SCSU and LJMU will provide a team of instructional design consultants to support faculty development and the delivery of courses. However, the report did not provide details specifying the role of faculty at each institution in course content and curriculum development. We therefore ask that the Fall 2019 report clarify this matter as evidence that "[t]he institution places primary responsibility for the content, quality, and effectiveness of the curriculum with its faculty. Faculty have a substantive voice in matters of educational programs, faculty personnel, and other aspects of institutional policy that relate to their areas of responsibility and expertise" (3.15).

As mentioned positively above, we are gratified to learn that both SCSU and LJMU will provide students enrolled in the jointly delivered degree programs with in-person and online access to student support services, including library and information resources, academic writing support, and academic advising. In addition, classroom and laboratory space as well as relevant field data collection equipment is sufficient to support the MS in Coastal Resilience program, and dedicated staff at each institution will be assigned to support the proposed programs. We further note with favor that SCSU is launching an English Language Pathways Program in Spring 2018 for applicants whose TOEFL or IELTS scores do not meet the entry-level language requirements for admission into one of the joint programs. We look forward, through the Fall 2019 report, to receiving evidence that academic and student support services, including advising, are sufficient to support the MBA and the MS in Coastal Resilience joint degree programs as informed by our standards on *Students* and *Institutional Resources*:

The institution offers an array of student services, including physical and mental health services, appropriate to its mission and the needs and goals of its students. It recognizes the variations in services that are appropriate for residential students, at the main campus, at off-campus locations, and for distance education programs as well as the differences in circumstances and goals of students pursuing degrees (5.9).

The institution provides advising and academic support services appropriate to the student body. The institution's faculty and professional staff collectively have sufficient interaction with students outside of class to promote students' academic achievement and provide academic and career guidance (5.10).

A clear description of the nature, extent, and availability of student services is readily available to students and prospective students. Newly enrolled students are provided with an orientation that includes information on student services as well as a focus on academic opportunities, expectations, and support services (5.11).

The institution provides access to library and information resources, services, facilities, and qualified staff sufficient to support its teaching and learning environments and its research and public service mission as appropriate (7.22).

The institution's physical and electronic environments provide an atmosphere conducive to study and research (7.24).

As documented in the proposal, the joint MBA program is equivalent to the low-residency MBA program currently offered by SCSU, and existing institutional policies and procedures related to program assessment and review will apply to the proposed joint MBA program. The MS in Coastal Resilience joint program, however, is new and the report did not specify the policies and procedures that will be used for the systematic review of this program. The Fall 2019 report will afford SCSU an opportunity to update the Commission on its progress in developing these policies and procedures. Our standard on *The Academic Program* is relevant here:

The institution develops, approves, administers, and on a regular cycle reviews its academic programs under institutional policies that are implemented by designated bodies with established channels of communication and control. Review of academic programs includes evidence of student success and program effectiveness and incorporates an external perspective. Faculty have a substantive voice in these matters (4.6).

The Commission expressed appreciation for the report submitted by Southern Connecticut State University and hopes its preparation has contributed to institutional improvement. We appreciate your cooperation with the effort to provide public assurance of the quality of higher education in New England.

You are encouraged to share this letter with all of the institution's constituencies. It is Commission policy to inform the chairperson of the institution's governing board of action on its accreditation status. In a few days we will be sending a copy of this letter to Mr. Matt Fleury. The institution is free to release information about the report and the Commission's action to others, in accordance with the enclosed policy on Public Disclosure of Information about Affiliated Institutions.

If you have any questions about the Commission's action, please contact Barbara Brittingham, President of the Commission.

Sincerely,

Dante l'ange

David P. Angel

DPA/jm Enclosures

cc: Mr. Matt Fleury

New England Commission of Higher Education

August 8, 2019

DAVID QUIGLEY Chair (2021) Boston College

COLEEN C PANTALONE (2019) Northeastern University

KASSANDRA S ARDINGER (2020) Truslee Member Concord NH

FRANCESCO C CESAREO (2020) Assumption College F JAVIER CEVALLOS (2020) Framingham State University

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DONALD D DEHAYES (2020) University of Rhode Island

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ELLEN L KENNEDY (2021). Berkshire Community College ABDALLAH A. SFEIR (2021) Lebanese American University JOHN M. SWEENEY (2021) Providence College

President of the Commission BARBARA E BRITTINGHAM bbrittingham@neche org

Sr. Vice President of the Commission PATRICIAM O BRIEN, SND pobmen@neche org Vice President of the Commission CAROL L. ANDERSON canderson@neche.org

Vice President of the Commission LAURA M GAMBINO Igambino@neche org

Vice President of the Commission PAULA A HARBECKE pharbecke@neche org

ELEANOR BAKER (2021) Falmouth ME

GEORGE W TETLER, Vice Chair (2019) Worcesler, MA HARRY E DUMAY (2019) College of Our Lady of the Elms JEFFREY R. GODLEY (2019) Groton, CT

Dr. Joseph Bertolino President Southern Connecticut State University 501 Crescent Street New Haven, CT 06515-0901

Dear President Bertolino:

This letter is in response to your July 16, 2019 request to Barbara Brittingham, President of the Commission, to postpone the NECHE site visit scheduled for Fall 2019 to review Southern Connecticut State University's (SCSU) success in implementing it plans to offer two joint degree programs – an MBA and an MS in Coastal Resilience – with Liverpool John Moores University in the United Kingdom. We appreciate the additional information indicating that the launch of the two programs has been delayed until Fall 2020.

We do realize that an institution's plans to offer new degree programs, particularly those involving international partners, are often subject to change and revision. Therefore, in light of the information provided, we concur that it makes sense to delay the evaluation visit until Spring 2021 (before the first students graduate) so that the review can take place in conjunction with SCSU's comprehensive evaluation. Please let us know if your plans change.

Best wishes for the coming academic year.

Pauso Hiltz

Paula A. Harbecke Vice President

PAH/bec

ASAC 9-6-2019 Page 60 of 85

CT BOARD OF REGENTS FOR HIGHER EDUCATION

RESOLUTION

concerning

New Program Approval

September 19, 2019

RESOLVED: That the Board of Regents for Higher Education approve the licensure and accreditation of a new degree option – Data Science – within Technology Studies program (CIP Code: 27.0304) leading to an Associate of Science degree, requiring 67 course credits delivered via a hybrid modality, at Northwestern Connecticut Community College; for a three-year period

A True Copy:

Erin A. Fitzgerald, Secretary of the CT Board of Regents for Higher Education

ITEM

Licensure and accreditation of a new degree option – Data Science – within Technology Studies program leading to an Associate of Science degree at Northwestern Connecticut Community College

BACKGROUND

Summary

The employment of data scientists is becoming more popular in a number of industries. While many current jobs in this field require a bachelor degree, new jobs are being created at an associate degree level of entry which allows NCCC students to enter this field early while receiving mentorship within various organizations from senior data scientists. It is expected that that local and state employers will soon follow national trends in hiring data science technicians.

Rationale

The proposed degree option will consist of 18 existing courses plus three new courses to be established by current faculty members. In a recent survey of 67 NCCC students, 80% of them expressed interest in taking courses in data science.

The institution's marketing and promotion campaign will include press releases and the production of website pages, videos, brochures, flyers and a comprehensive promotional packet. Local and state employers will received targeted promotional material.

Resources

Projected revenue will exceed projected expenditures each year for the program's initial three years.

RECOMMENDATION

Following its review and deliberative process, it is the recommendation of the Academic Council that the Board of Regents approve the establishment of this program. The System's Provost and Senior Vice President for Academic and Students Affairs concurs with this recommendation.

09/06/2019 – BOR Academic & Student Affairs Committee 09/19/2019 – Board of Regents

SECTION 1: GENERAL INFORMATION					
Institution: Northwestern Connecticut Community College	Connecticut Community Date of Submission to CSCU Office of the Provost:				
Most Recent NEASC Institutional Accreditation Action and	Date:				
Program Characteristics					
Name of Program: Technology Studies: Data Science Option Degree: Title of Award (<i>e.g. Master of Arts</i>) Associate of Science Certificate: (<i>specify type and level</i>) Anticipated Program Initiation Date: Spring 2020 Anticipated Date of First Graduation: Spring 2021 Modality of Program: On ground Online x Combin If "Combined", % of fully online courses? 71-76% Total # Cr the Institution Requires to Award the Credential	Program Credit Distributi # Cr in Program Core Cour # Cr of Electives in the Fiel # Cr of Free Electives: 0 # Cr Special Requirements Total # Cr in the Program (From "Total # Cr in the Pro part of/belong in an already institution: 58	 # Cr in Program Core Courses: 58 # Cr of Electives in the Field: 9 # Cr of Free Electives: 0 # Cr Special Requirements (include internship, etc.): 0 Total # Cr in the Program (sum of all #Cr above): 67 From "Total # Cr in the Program" above, enter #Cr that are part of/belong in an already approved program(s) at the institution: 58 			
Type of Approval Action Being Sought: Licensure or	x Licensure and Accreditation -	- (see NOTE below)			
CIP Code No. (optional) 27.0304 Title of CIP Code	e Data Science				
If establishment of the new program is concurrent with discontinuation of related program(s), please list for each program:Program Discontinued:CIP:OHE#:Accreditation Date:Phase Out PeriodDate of Program Termination					
Institution's Unit (e.g. School of Business) and Location (e.g. main campus) Offering the Program: STEM Main Campus					
 Other Program Accreditation: If seeking specialized/professional/other accreditation, name of agency and intended year of review: If program prepares graduates eligibility to state/professional license, please identify: (As applicable, the documentation in this request should addresses the standards of the identified accrediting body or licensing agency) 					
Institutional Contact for this Proposal: Crystal Wiggins Title: Associate Professor - Math Tel.: 860-738-6310 e-mail: cwiggins@nwcc.edu					

CSCU REVIEW STATUS (For System Office Use Only - please leave blank)

Notes regarding Application: Log of Steps Toward Approval: Date of Approval: Date for Inclusion in BOR-ASA Meeting Package: Comments:

NOTE: Institutions shall seek approval of new programs either as *Licensure* or simultaneous *Licensure and Accreditation*:

a. *Licensure*, normally granted for a period of three years, authorizing the enrollment of students and their advancement toward the completion of degree requirements; or

b. *Licensure and Accreditation,* simultaneously authorizing the enrollment and award of credentials to students. The accreditation action is considered renewed with each regional accreditation of the institution.

Simultaneous licensure and accreditation is generally sought for new degree and certificate programs that are closely related to a set of already existing programs and aligned with institutional strengths. New degree programs are normally submitted for licensure only, to be accredited after three years. Certificates normally are licensed and accredited simultaneously.

SECTION 2: PROGRAM PLANNING ASSESSMENT

Alignment of Program with Institutional Mission, Role and Scope

(Please provide objective and concise statements)

The Technology Studies: Data Science option A.S. degree provides exposure and essential applications in key elements of data science including data structures and data sources, programming languages, statistical principles, computing and analytics, data management, machine learning tools, and data science applications.

This degree will afford our students with more opportunities in the job market by providing them with highly sought-out preferred skills. The use of data scientist teams is becoming more popular in the business industry. While current jobs require a bachelor degree, new jobs are being created at the associates degree level of entry which allows our students to enter this field early while receiving mentorship within these organizations from senior data scientists. NCCC's mission is to provide accessible education and this degree primarily online.

Addressing Identified Needs

• How does the program address CT workforce needs and/or the wellbeing of CT society/communities – and include a description/analysis of employment prospects for graduates of this proposed program (Succinctly present as much factual evidence and evaluation of stated needs as possible)

Student Internships are currently found in companies in Connecticut, New England, and nationally. Internships in Data Science may be during the last year of a Bachelor's degree at the following companies: Google, Facebook, LinkedIn, and Amazon. There are summer internships offered through RStudio at any level/degree. Local jobs that would be applicable to students with this degree are forthcoming. A Bachelor's degree would open up opportunities at entry level positions (\$60K-\$100K) with these titles:

- Aetna (Hartford) Lead Data Scientist
- CyberCoders (NY) Data Scientist
- United Technologies (East Hartford) Product Security Data Scientist
- The Hartford (Hartford) Marketing Data Scientist
- Infosys (Hartford) Data Visualization Science

However, the market in other parts of the country is moving toward hiring Data Science Technicians with associates degrees and as that trend comes to Connecticut, our students will be ready to fill those jobs.

• How does the program make use of the strengths of the institution (*e.g. curriculum, faculty, resources*) and of its distinctive character and/or location?

This degree is made up of 3 new courses (all are a part of the Data Science certificate) and 18 existing courses. Statistics II is new to Northwestern but not to the system. The two data science courses are new to the system and without hiring new faculty, there are limited existing faculty that can teach them. Northwestern has a full-time faculty that can teach both. The use of the two existing courses will increase enrollment in those already running courses. In a recent survey of 67 NCCC students, 80% of them expressed interest in taking courses in data science.

- Please describe any transfer agreements with other CSCU institutions that will become instituted as a result of the approval of this program (*Please highlight details in the Quality Assessment portion of this application, as appropriate*) SCSU will be offering a BS in Data Science starting Fall 2019. SCSU has expressed interest in working with NCCC and other community colleges to create a pathway for data science. There are no other CSCU institutions offering data science programs at this time.
- Please indicate what similar programs exist in other CSCU institutions, and how unnecessary duplication is being avoided Data Science programs can vary greatly from one to another. There are several focus areas with in "Data Science." As of right now, there are no other community colleges nor CSU's that are offering this degree. ECSU has a Mathematics BS with concentration in Data Science. SCSU developed a BS degree in data science which is scheduled to start fall 2019. The University of Hartford has begun to create a

Page 3 of 13 ASAC 9-6-2019 Page 65 of 85

concentration in data science and should be available by Fall 2019. They also have a BA/BS degree in Data Science in the works. **Both the University of Hartford and SCSU are a part of the College of Technology. The University of Saint Joseph has a concentration in data science that is attached to their computer science degree. Post University currently offers a BS in data science.

Cost Effectiveness and Availability of Adequate Resources

(Please complete the PRO FORMA Budget – Resources and Expenditure Projections on page 6 and provide a narrative below regarding the cost effectiveness and availability of adequate resources for the proposed program. Add any annotations for the budget form.)

Marketing and Promotion

New programs need strong marketing to create awareness and to enhance institutional branding. Coupled with the high demand for data science workers, this program would benefit from targeted marketing. A line item for marketing has been added to the *PRO FORMA Budget – Resources and Expenditure Projections* section; these funds will be used for the non-in-house production costs of marketing materials and promotional initiatives, including but not limited to the following:

1. Production of Marketing Materials and Content Development

Web pages on college website, videos, brochures, flyers, comprehensive promotional packets, etc.

2. Press release distribution (local and regional)

- State of Connecticut Executive Branch Media Contact List
- NW CT Chamber of Commerce
- Republican American
- Register Citizen
- Bristol Press
- Charter Communications
- Litchfield BZ
- Hartford Courant
- Lakeville Journal
- Friends of Main Street
- Post Latino.com
- CT Mirror
- FM 97.3 WZBG
- Sandisfield Times
- HamletHub
- NW CT Arts Council
- Norfolk Now

3. Targeted Promotions to Industry

The following companies have listed data science jobs on popular job search websites such as CareerBuilder, Indeed and Monster, or have been personally contacted by Data Science faculty to create awareness that Data Science AS and Certificate programs were in development. Promotional packets containing press releases, brochures, and other marketing pieces and contact information will be mailed to the respective Human Resources departments.

- Aetna
- Cigna
- ConnectiCare
- Data Robot
- Disney

- The Hartford
- Hartford Athletics
- The Hartford Steamer
- IBM
- Infosys
- The Jackson Laboratory
- Lego
- Otis
- Santander
- Travelers
- United Bank
- US Census Bureau

4. Email

- Current FT and PT students
- Graduates: 2015-2019
- Non-credit students: 2015-2019

5. Social Media (Facebook (FB) and Instagram(IG))

- Posts on NWCC FB and IG pages
- Paid ads on FB and IG (\$10-\$15 est. per ad)

The following metrics will be followed to identify trends, determine cost effectiveness and cull data that may lend to additional marketing inroads

- Post Reach (The number of unique viewers to whom a post is served)
- Engagement (Reactions, Comments, Shares, Impressions, etc.)
- Cost per "engagement"

- Demographics of Engagements (Note: Most of those who interact with a post/ad on our FB and IG pages are women between 25-55 (consistent with NWCC's student demographics) – possible opportunities for collaboration with girls/women in STEM initiatives statewide.)

SECTION 3: PROGRAM QUALITY ASSESSMENT

Learning Outcomes - L.O. (Please list up to seven of the most important student learning outcomes for the program and concisely describe assessment methodologies to be used in measuring the outcomes. If the program will seek external accreditation or qualifies graduates to opt for a professional/occupational license, please frame outcomes in attention to such requirements. With as much detail as possible, please map these learning outcomes to courses listed under the "Curriculum" section of this application)

Upon successful completion of all program requirements, graduates should be able to:

- 1. Master key facets of data investigation, including data wrangling, cleaning, sampling, management, exploratory analysis, regression and classification, prediction, and data communication
- 2. Implement foundational concepts of data computation, such as data structure, algorithms, simulation, and analysis.
- 3. Utilize various technologies to organize, analyze, explore, and visualize data
- 4. Execute data organization, exploration, and develop proficiency in a programming language
- 5. Apply advanced statistical techniques
- 6. Understand machine learning models and their applications

Program Administration (Describe qualifications and assigned FTE load of administrator/faculty member responsible for the day-today operations of the proposed academic program. Identify individual for this role by name or provide time frame for prospective hiring) This degree will be overseen and advised by Crystal Wiggins, Associate Professor of Mathematics, who has researched and designed this program. She is the content expert on campus and has pursued additional professional development in this area. Approximately 40% of her FTE will be spent on teaching, advising, and administering in this program.

Faculty (*Please complete the faculty template provided below to include current full-time members of the faculty who will be teaching in this program and, as applicable, any anticipated new positions/hires during the first three years of the program and their qualifications*) How many new full-time faculty members, if any, will need to be hired for this program?

What percentage of the credits in the program will they teach? N/A

What percent of credits in the program will be taught by adjunct faculty?

Current Full-Time faculty members and/or adjunct faculty will teach in the program. At the beginning of the program, 100% of the data science courses will be taught by current full-time faculty.

Describe the minimal qualifications of adjunct faculty, if any, who will teach in the program A Masters Degree is required to teach the courses in the program.

Special Resources (Provide a brief description of resources that would be needed specifically for this program and how they will be used, e.g. laboratory equipment, specialized library collections, etc. Please include these resources in the Resources and Expenditures Projections spreadsheet)

No special resources are required for this program. **Open source and free software** will be utilized for coding, statistics, and machine learning.

Curriculum

(Please list courses for the proposed program, including the core/major area of specialization, prerequisites, electives, required general education courses (undergraduate programs), etc. Using numerals, map the Learning Outcomes listed in the previous section to relevant program courses in this table. Mark any new courses with an asterisk * and attach course descriptions. Mark any courses that are delivered fully online with a double asterisk ** Please modify this format as needed)

Course Number and Name	L.O. # ¹	Pre- Requisite	Cr Hrs	Course Number and Name	L.O. #	Cr Hrs
Program Core Courses				Other Related/Special Requirements*		
ENG 101 Composition**	10	Placement or ENG 096	3			
ENG 102 Technical Writing**	10	ENG 101	3			
COM 173 Public Speaking**	10		3			
History or Economics Elective**	varies	varies	3			
Psychology or Sociology Elective**	varies	varies	3			
Fine Arts Elective**	varies	varies	3			
Geography or Political Science or History Elective**	varies	varies	3			
MAT 167 Statistics**	4,7,8,9	MAT 137	3			
MAT 186 Pre-Calculus	4,7,8,9	MAT 137	4			
PHY 121 Gen Physics or PHY 110 Intro to Physics	4,8,9	varies	4			
CHE 121 Gen Chemistry or CHE 111 Concepts of Chemistry	4,8,9	varies	4			
CAD or Directed Elective	varies	varies	3			
Directed Elective	varies	varies	3			
Directive Elective	varies	varies	3			
Math or Programming or Computer Applications Elective**	varies	varies	3			
Math or Programming Elective**	varies	varies	3			
Math or Programming Elective**	varies	varies	3			
MAT 254 Calculus I	4,7,8,9	MAT 186	4			
MAT 222 Statistics II with Technology Apps*(**)	2,3,4,7,8,9	MAT 167	3			
DTS 201 Data Science in R*(**)	2,3,4,5,6,8,9,10	MAT* 167	3			
DTS 220 Intro to Machine Learning*(**)	2,3,4,5,6,8,9,10	DTS* 201	3			

¹ From the Learning Outcomes enumerated list provided at the beginning of Section 3 of this application

		JOILIN			
Core Course Prerequisites	Elective Courses in the Field				
Total Other Credits Required to Issue Arts Core/Liberal Ed Program)	Credential (e.g. GenEd/Liberal				
Program Outline (Please provide a summary of program requirements including total number of credits for the degree, special admission requirements, capstone or special project requirements, etc. Indicate any requirements and arrangements for clinical affiliations, internships, and practical or work experience. For example: "The Finance Major entails 18 credits of Related Course requirements from a range of disciplines (6 credits of which apply to the Liberal Arts Core (LAC), or institution's GenEd program), 24 credits of courses in Business (3 credits of which apply to the LAC/GenEd), 18 credits of coursework in Finance (including a 6-credit internship), and 9 elective credits from a list that includes courses in Economics, Finance, and Business. Students must take a minimum of 24 credits of coursework for the major at the institution and must maintain a GPA of 2.5.")					
The Technology Studies: Data Science Option A.S. Degree entails 21 credits in general education, 9 credits in directed electives, 6 credits in data science applications, 22 credits in required math and science, 9 credits in math or programming or computer applications. Students must take a minimum of 67 credits of coursework for the degree at the institution.					

***Special Requirements** include co-curriculum activities – structured learning activities that complement the formal curriculum – such as internships, innovation activities and community involvement.

NOTE: The PRO FORMA Budget on the last page should provide reasonable assurance that the proposed program can be established and is sustainable. Some assumptions and/or formulaic methodology may be used and annotated in the "Cost Effectiveness ..." narrative on page 2.

Full-Time Faculty Teaching in this Program (Note: If you anticipate hiring new faculty members for this program you may list "to be hired" under name and title. Provide required credentials, experience, and other responsibilities for each new position anticipated over the first three years of implementation of the program)

Faculty Name and Title	Institution of Highest Degree	Area of Specialization/Pertinent Experience	Other Administrative or Teaching Responsibilities
Crystal Wiggins, Associate Professor of Mathematics	CCSU	Mathematics & Statistics Received training through a variety of sources; StatPREP, QUBES FMN, R Workshops, Data Camp, Data Quest, PIC Math, etc.	
CONNECTICUT BOARD OF REGENTS FOR HIGHER EDUCATION Connecticut State Colleges & Universities

APPLICATION FOR NEW PROGRAM APPROVAL

PRO FORMA Budget - Resources and Expenditures Projections (whole dollars only)

PROJECTED Enrollment	First Year					Second Year						Third Year						
	Fall Semester		Spring Semester		Summer		Fall Semester		Spring Semester		Summer		Fall Semester		Spring Semester		Summer	
	FT	PT	FT	РТ	FT	PT	FT	PT	FT	РТ	FT	PT	FT	PT	FT	PT	FT	PT
Internal Transfer (from other programs		3		3				3		3				3		3		
New Students (first time matriculating)								3		3				8		8		
Continuing Students progressing to credential		9		9				9		9				9		9		
Headcount Enrollment		12		12				15		15				20		20		
Total Estimated FTE per Year ¹		6		6				9		9				13		13		
PROJECTED Program Revenue	First Year				Second Year					Third Year								
	Fall Se	emester	Spring S	emester	Sun	nmer	Fall Se	emester	Spring S	Semester	Sun	nmer	Fall Se	emester	Spring S	Semester	Sun	nmer
	FT	РТ	FT	РТ	FT	PT	FT	РТ	FT	РТ	FT	РТ	FT	PT	FT	PT	FT	PT
Tuition ²		11,736		11,736				17,604		17,604				25,428		25,428		
Tuition from Internal Transfer ²																		
Program Specific Fees (lab fees, etc.)																		
Other Revenue (annotate in narrative)		14,388		14,388				21,582		21,582				31,174		31,174		
Total Annual Program Revenue	26,124 26,124					39,186		39,186		56,602 5		56,602						
PROJECTED Program							NOTE: implement	Existing re ting and fir	egulations ancing the	require that proposed pr	: "an appli ogram duri	ication for ng the first	a new pro cycle of op	gram shall eration, bas	include a ed on project	complete a cted enrolln	nd realistic nent levels;	c plan for the nature
Expenditures	First	Year	Secon	d Year	Third	Year	requirements; and projected sources of funding. If resources to operate a program are to be provided totally or in part through											
Administration (Chair or Coordinator) ⁴	7,800		8,000		8,400		reallocation	reallocation of existing resources, the institution shall identify the resources to be employed and explain how						plain how e	existing programs will			
Faculty (Full-time, total for program) ⁴	23,200		25,200		25,800		the quality	the quality of continuing programs below acceptable levels."					ncourageu,	a, provided such reallocation does not reduce				
Faculty (Part-time, total for program) ⁴							1 1 $FTE = 12$ credit hours for undergraduate programs; 1 $FTE = 12$ credit hours for graduate programs; both for Fal						for Fall &	Spring				
Support Staff (lab or grad assist, tutor)							 2 Revenues from all courses students will be taking. 2 Conital outlaw costs, instructional analysis for response and corriging, etc., can be such all 											
Library Resources Program							4 If full-time person is solely hired for this program, use rate time: otherwise, use a r				ercentage.	centage. Indicate if new hires or existing						
Equipment (List in narrative)							faculty/staff.				,,							
Other ⁵ (Marketing)	500		500	500 500		5 e.g. student services. Course development would be direct payment or release time; marketing is cost of marketing that program separately.												
Estimated Indirect Costs ⁶	16,240		17,640		18,060		 6 Check with your Business Office – community colleges have one rate; the others each have their own. Indirect Cost mi 					night						
Total Expenditures per Year	47,740		51,340		52,760		include such expenses as student services, operations and maintenance.							-				

**Assume state per FTE revenue of \$2,398. Assume tuition per FTE revenue \$1,956.

**Budget only addresses NEW courses

CONNECTICUT BOARD OF REGENTS FOR HIGHER EDUCATION Connecticut State Colleges & Universities APPLICATION FOR NEW PROGRAM APPROVAL

NORTHWESTERN CONNECTICUT COMMUNITY COLLEGE

COURSE SYLLABUS

Course Title: Statistics II with Technology Applications

Course # MAT*222

Course Description: 3 credits

Designed for those students who desire a more in-depth study of statistics, especially those wishing to transfer to a four-year institution. This data-driven course will cover the following topics: two variable hypothesis testing, statistical inference about means and proportions with two populations, linear regression and correlation, multiple regression, analysis of variance, inferences about population variances, goodness of fit and independence, chi-squared tests, and nonparametric methods. Statistical software is integrated in this course. Microsoft Excel is required

Pre-Requisite: C or better in MAT*167 or equivalent

Goals:

The student should develop an understanding of the various statistical tests that are used to analyze and interpret data. The student should be able to differentiate which statistical test to use given the type of data presented.

Outcomes:

Upon successful completion of this course, each student must have demonstrated understanding and competency in each of the following topics and techniques:

1. Utilize appropriate methodology to test hypotheses about the means, proportions, variance and standard deviation, of one and two populations

2. Understand and use ANOVA to analyze and interpret data

3. Apply the F-test and the chi-square test to analyze population variances, goodness-of-fit and independence

4. Derive linear and multiple regression formulas and correlations; interpret and apply the information

5. Utilize various nonparametric methods to draw conclusions about data

6. Understand the value of technology to analyze data and support statistical conclusions

CONNECTICUT BOARD OF REGENTS FOR HIGHER EDUCATION Connecticut State Colleges & Universities APPLICATION FOR NEW PROGRAM APPROVAL

NORTHWESTERN CONNECTICUT COMMUNITY COLLEGE

COURSE SYLLABUS

Course Title: Data Science in R

Course # DTS *201

Course Description: 3 credits

Introduction to the field of data science and the programming language of R. Explores the data science lifecycle, including question formulation, data collection and cleaning, exploratory data analysis and visualization, statistical inference and prediction, and decision-making. Focuses on quantitative critical thinking and key principles and techniques needed to carry out this cycle. No prior programming experience required.

Pre-Requisite: C or better in MAT*167

Goals:

Students will develop a strong foundation in the programming language of R, including the various concepts, methodologies, and competencies that a data scientist must possess in order to be successful. These include the data science lifecycle, decision-making, and quantitative critical-thinking.

Outcomes:

Upon successful completion of this course, each student will be able to:

- 1. Explain field of data science.
- 2. Apply techniques to import, clean, and transform data.
- 3. Analyze and interpret data to tell a story.
- 4. Use the programming language R to manipulate data.

CONNECTICUT BOARD OF REGENTS FOR HIGHER EDUCATION Connecticut State Colleges & Universities APPLICATION FOR NEW PROGRAM APPROVAL

NORTHWESTERN CONNECTICUT COMMUNITY COLLEGE

COURSE SYLLABUS

Course Title: Intro to Machine Learning Course # DTS* 220

Course Description: 3 credits

This course focuses on machine learning as an integral tool for data science, including how to use data to automatically understand the world, make complex decisions, and even predict the future. R programming language will be used.

Pre-Requisite: C or better in DTS* 201

Goals:

Students will analyze data by understanding and using a wide variety of machine learning tools to solve data science problems, including: supervised methods for regression, clustering and classification (linear models, trees, neural networks, ensemble methods, instance-based methods).

Outcomes:

Upon successful completion of this course, students will be able to:

- 5. Explain machine learning and its various tools
- 6. Describe theoretical foundations, algorithms, methodologies, and applications for machine learning
- 7. Learn the fundamentals of predictive modeling
- 8. Explore and use classification and clustering algorithms

CT BOARD OF REGENTS FOR HIGHER EDUCATION

RESOLUTION

concerning

Program Suspension

September 19, 2019

RESOLVED: That the Board of Regents for Higher Education approve the suspension of a program in Energy Management (CIP Code: 15.0503, OHE # 18541) leading to an Associate of Applied Science degree at Tunxis Community College, with a phase-out/teach-out phase until May 2022.

A True Copy:

Erin A. Fitzgerald, Secretary of the CT Board of Regents for Higher Education

ITEM

Suspension of a program in Energy Management leading to an Associate of Applied Science degree at Tunxis Community College, until May 2022

BACKGROUND

Summary

The program is a Low Completer with fewer than three graduates each year. The institution has declared the program does not serve the needs of students and industry.

Rationale

During the suspension, the institution will evaluate the AAS degree and all its associated certifications. This degree is part of the institution's STEAM Plan (Science, Technology, Engineering, Art, Mathematics & Advanced Manufacturing) to be re-organized. Several options will be considered.

Phase-Out/Teach-Out Strategy

No new students will be admitted to this degree program. Currently enrolled students will be afforded the following options:

- 1) Provide independent studies for remaining courses to complete the program (if within 3 courses),
- 2) Explore options for appropriate course substitutions as needed to attain certificates or degree (if applicable), or
- 3) Advise students on the application of already-earned credits to a different program (Technology Studies is most appropriate) to help fulfill their educational goals in a timely manner.

The currently enrolled students will be afforded opportunities to complete the degree if they desire. They will be advised that the structure of the program may change from what has been communicated to them already. Such an example would be that a course is now going to run in an online or hybrid type format versus a traditional classroom model of instruction. All currently enrolled students have been contacted and a schedule of remaining required courses has been developed for Fall '19 and Spring '20.

Resources

No resources are required for the suspension of this program.

RECOMMENDATION

It is the recommendation of the System's Provost and Senior Vice President for Academic and Students Affairs that the Board of Regents approve suspension of this program.

09/06/2019 – BOR Academic & Student Affairs Committee 09/19/2019 – Board of Regents

CONNECTICUT BOARD OF REGENTS FOR HIGHER EDUCATION Connecticut State Colleges & Universities System Office APPLICATION FOR SUSPENSION OF EXISTING PROGRAM

SECTION 1: GENERAL INFORMATION								
Institution: Tunxis Community College	Date of Submission to CSCU Office of the Provost: May 2019							
Program: Energy Management (J14JA96) CIP: 150503 OHE#: 018541 Accreditation Date: 3/29/16 Date Program will be reinstated or deleted (one, two, or three years maximum): May 2022								
Program Characteristics Name of Program: Energy Management Degree: Title of Award (e.g. Master of Arts) Associate of Applied Science (A.A.S.) Certificate: (specify type and level) N/A Modality of Program: X On ground Online								
Institution's Unit (e.g. School of Business) and Location (e.g. main campus) offering the Program: Main Campus								
Institutional Contact for this Proposal: Mathew Spinelli	Title: Director of STEAMTel.: 860-773-1672 e-mail: mspinelli@txcc.commnet.edu							

SECTION 2: RATIONALE AND JUSTIFICATION FOR PROGRAM SUSPENSION

Narrative

The Energy Management AAS degree is a low-completion program, with fewer than three graduates per year, and is currently not serving the needs of students and industry nor helping fulfill the mission of the college. During suspension, we will be reevaluating both the AAS degree as well as all associated credit and noncredit certifications. The degree is part of an overall STEAM plan which will result in a merger or re-organization of existing programs; one option being looked at is moving all or part of the Energy Program under our Technology Studies program and the COT. To accomplish this, we are working with local industry partners and the program funder – the Connecticut Department of Energy and Environmental Protection, which provides full funding for the credit and noncredit development of Tunxis' Energy Management program.

Phase Out/Teach Out Strategy

No new students will be enrolled to this degree program. The STEAM Director will work with those students currently enrolled in the program, affording them the following options:

- 1) Provide independent studies for remaining courses to complete the program (if within 3 courses)
- 2) Explore options for appropriate course substitutions as needed to attain certificates or degree (if applicable)
 - Or
- 3) Advise students on the application of already-earned credits to a different program (Technology Studies is most appropriate) to help fulfill their educational goals in a timely manner.

The currently enrolled students will be afforded opportunities to complete the degree if they desire. They will be advised that the structure of the program may change from what has been communicated to them already. Such an example would be that a course is now going to run in an online or hybrid type format versus a traditional classroom model of instruction.

All currently enrolled students have been contacted and a schedule of remaining required courses has been developed for Fall '19 and Spring '20.

CONNECTICUT BOARD OF REGENTS FOR HIGHER EDUCATION Connecticut State Colleges & Universities System Office APPLICATION FOR SUSPENSION OF EXISTING PROGRAM CSCU REVIEW STATUS (For System Office Use Only - please leave blank)

Notes regarding Application: Log of Steps Toward Approval: Date of Approval: Date for Inclusion in BOR-ASA Meeting Package: Comments:

CONNECTICUT BOARD OF REGENTS FOR HIGHER EDUCATION

RESOLUTION

concerning

Renaming Institution's Academic Units from Schools to Colleges

at

Southern Connecticut State University

September 19, 2019

- WHEREAS, Institutions of higher education commonly use the term "School" to designate academic units that prepare students in a focused set of disciplines and their related profession(s), and commonly use the term "College" to organize related Schools under the broader umbrella; and
- WHEREAS, Unit-based consultations occurred on the campus of Southern Connecticut State University during the Spring 2019 semester regarding a proposal to rename its four Schools, concluding with faculty members of the School of Arts and Sciences, the School of Education and the School of Health and Human Services voting to request a change to the College of Arts and Sciences, the College of Education and the College of Health and Human Services, respectively; and
- WHEREAS, The institution's Faculty Senate has unanimously endorsed the proposed changes in nomenclature, and SCSU President Joseph Bertolino has forwarded the request to Mark E. Ojakian, President of the Connecticut State Colleges and Universities System; and therefore, be it
- RESOLVED, That the Board of Regents authorize the renaming of the School of Arts and Sciences, the School of Education and the School of Health and Human Services at Southern Connecticut State University to the College of Arts and Sciences, the College of Education and the College of Health and Human Services, respectively; and be it further
- RESOLVED, That the designation "College" will not materially affect the institution's faculty, staff or students, will not affect standards for graduation requirements, assessment or accreditation, and will not confer any special rights or privileges for the three Colleges beyond those afforded the SCSU School of Business, which has elected to retain its current name.

A True Copy:

Erin A. Fitzgerald, Secretary of the CT Board of Regents for Higher Education

ITEM

Renaming three of the four institutional academic units a "College" instead of a "School" at Southern Connecticut State University

BACKGROUND

Deliberations occurred across the campus of SCSU regarding a proposal to change the nomenclature of its academic units from "School" to "College" during the 2019 Spring semester. Three of the institutional units voted in favor of the change. In his letter of request to the Connecticut State Colleges and Universities System Office for the Board's consideration, SCSU President Joseph Bertolino noted the common usage of the two designations among institutions of higher education. He further explained that "new programs, new majors, and new areas of emphasis have all emerged" in each of the three Schools over the course of the past ten years. He reasoned that: "At this time, it is more appropriate for each of these units to be constituted as a College, which will allow for relevant Schools to be established within each College. Such a name change would also add to the naming opportunities at our institution, as it is feasible to embed a named, more focused 'School" within a larger 'College'." If approved by the Board, President Bertolino expects full implementation of the name change to be completed by the Fall 2020 semester.

RECOMMENDATION

The System's Provost and Senior Vice President for Academic and Students recommends that the Board of Regents authorize the proposed renaming of academic units at Southern Connecticut State University from School of Arts and Sciences, the School of Education and the School of Health and Human Services to College of Arts and Sciences, the College of Education and the College of Health and Human Services, respectively.

09/06/2019 – BOR Academic & Student Affairs Committee 09/19/2019 – Board of Regents

Office of the President

State University

Southern Connecticut

то:	Mr. Mark Ojakian								
	President, Connecticut Board of Regents for Higher Education								
FROM:	Dr. Joseph Bertolino								
	President, Southern Connecticut State University								
DATE:	July 25, 2019								
SUBJECT:	Request to rename the following Schools as Colleges:								
	School of Arts and Sciences to College of Arts and Sciences								
	School of Health and Human Services to College of Health and Human Services								
	School of Education to College of Education								

I am writing to request approval of SCSU's proposal to rename the School of Arts and Sciences, the School of Education, and the School of Health and Human Services as the College of Arts and Sciences, the College of Health and Human Services, and the College of Education respectively. During the Spring 2019 semester, the SCSU campus community was consulted on the proposal to change the names of these three Schools to Colleges. The Dean from each School discussed this proposal with their Department Chairpersons and convened school-wide meetings with interested faculty and staff members. The Faculty Senate unanimously endorsed changing the names of the three Schools to Colleges, after which I immediately urged this initiative to move forward.

Institutions of higher education commonly use the term "School" to designate academic unit(s) that prepare students in a focused set of disciplines and their related profession(s). They commonly use the term "College" to organize several related Schools under the broader umbrella. SCSU's School of Arts and Sciences, School of Health and Human Services, and School of Education have each evolved significantly in the past ten years. New programs, new majors and new areas of emphasis have all emerged in each current School. At this time, it is more appropriate for each of these units to be constituted as a College, which will allow for relevant Schools to be established within each College. Such a name change would also add to the naming opportunities at our institution, as it is feasible to embed a named, more focused "School" within a larger "College."

Once the Board of Regents approves and the university implements these changes, the changes from "Schools" to "Colleges" will not materially affect faculty, staff, or students nor will they affect standards for graduation requirements, assessment, or accreditations. These name changes will not grant special privileges for the three Colleges beyond those afforded Southern's School of Business, which has elected to retain its current name.

If approved, these changes would be effective immediately, with full implementation completed by the Fall 2020 semester. In the event that naming opportunities, either College-wide or School-wide, present themselves Southern will follow BOR procedures accordingly. Thank you in advance for considering these proposed changes in nomenclature.

CONNECTICUT BOARD OF REGENTS FOR HIGHER EDUCATION Connecticut State Colleges & Universities BELOW-THRESHOLD NEW ACADEMIC OFFERING INFORMATION REPORT FORM

SECTION 1: BELOW-THRESHOLD GENERAL PROGRAM INFORMATION¹

Institution: Naugatuck Valley Community College	Date of Submission to CSCU Office of the Provost: June 2019				
Characteristics of Below-Threshold Offering Name of Offering: Principles of Manufacturing Type of Offering (e.g. Grad Certificate, Minor, Option) Certificate Anticipated Initiation Date: Spring 2019 Anticipated Date of First Completion (<i>if applicable</i>) : May 2019 Modality of Program: X On ground Online Combined If "Combined", % of fully online courses?	Credit Distribution of the Offering # Cr in Core Courses: 11 # Cr of Electives: 0 # Cr of Other: 0 # Cr Special Requirements <i>(e.g. internship):</i> 0 Total # Cr the Institution Requires to Award the Credential 11				
CIP Code No. (if applicable) 480503 Title of CIP Code Machine Shop Technology/Assistant					

Institution's Unit (e.g. School of Business) and Location (e.g. main campus) Offering the Program: STEM Division Advanced Manufacturing Technology Center, Waterbury and Danbury Campus

Description of Offering, Context and Justification (*Please provide a concise description of the proposed offering and learning objectives, including a list of courses if necessary for clarity. In one paragraph, please address need and anticipated benefits of the offering*)

The Principles of Manufacturing certificate is proposed as a bridge-in to the two-semester Advanced Manufacturing Machine Technology certificate for high school students in dual enrollment programs. Over the past 10+ years, Naugatuck Valley Community College (NVCC) has partnered with Waterbury Public Schools in the College Connections program. Currently, selected high school juniors and seniors take classes at NVCC to earn a CNC Machining certificate. The CNC Machining certificate was designed for college students in the Automated Manufacturing Engineering Technology A.S. degree program to earn a credential in CNC programming prior to graduating with the degree. However, the CNC Machining certificate assumes students have knowledge in college-level algebra and trigonometry that the College Connections high school students did not fully demonstrate. Additionally, the College Connections students would not be able to use the CNC Machining certificate to obtain a job because most companies want an employee with more experience as a CNC programmer.

The proposed Principles of Manufacturing certificate curriculum can be completed in the two-year time frame of College Connections, is at the appropriate academic level, would help students gain and be productive in entry-level manufacturing positions, would prepare the students for two National Association of Metalworking Skills (NIMS) certification tests, and prepare students for entry into the Advanced Manufacturing Machine Technology (AMMT) program as all 11 credits are part of the AMMT program.

¹ This information report pertains to academic programs not reaching the threshold requiring Board of Regents action. Information is shared with the BOR-Academic Council and included in the BOR-Academic and Student Affairs Committee meetings. Most CSUs and COSC cases will only require the completion of Section 1. All Community College programs require the completion of detailed course information in Section 2. The following academic programs are considered Below Threshold and do not require a BOR resolution: a) new minors, concentrations/options, specializations or certificate programs, outlined above, i.e.:

i. an undergraduate certificate of program of 30 credit hours or fewer which falls within an approved program,

ii. a new baccalaureate minor of 18 or fewer semester credit hours,

iii. a new undergraduate option or certificate program of 15 or fewer semester credit hours,

iv. a new graduate option or certificate program of 12 or fewer semester credit hours

b) programs that do not qualify students to become eligible for federal financial aid.

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Cost Effectiveness and Availability of Adequate Resources (As applicable, please provide a one paragraph narrative addressing resources, financial aspects of the program and how it will be sustained)

The cost of College Connections, and thus the Principles of Manufacturing program, is billed to the Board of Education of the city/town that sends students to the program. This includes the cost of the instructor (covered by tuition and fees) and materials. The equipment to be used by the Principles of Manufacturing program is maintained by the staff of the Advanced Manufacturing Technology Center of NVCC since the courses in the Principles of Manufacturing program are the same as the Advanced Manufacturing Machine Technology program courses. NVCC has been approached by multiple towns wishing to send students to the College Connections program. Since many school districts lack manufacturing shop programs, the sustainability in the immediate future is high. NVCC currently turns away potential partners due to space constraints.

Institutional Contact for this Proposal: Dr. H. Justin	Title: Associate Dean,	Tel.: 203-596-8690 e-mail:
Moore	STEM Division	hmoore@nv.edu

CSCU REVIEW STATUS (For System Office Use Only - please leave blank)

Notes regarding Application: Approved CIP Code No. *(if applicable):* Title of CIP Code: Log of Steps Toward Approval: Date of Approval: Date for Inclusion in BOR-ASA Meeting Package: Comments:

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SECTION 2: DETAILS OF NEW OFFERING (Community Colleges)

Curriculum

(Please provide details of the courses for the proposed offering. Mark any new courses with an asterisk * and attach descriptions. Mark any courses that are delivered fully online with a double asterisk **. Please modify this format as needed for each case)

Course Number and Name		Pre- Requisite	Cr Hrs	Course Number and Name	L.O. #	Cr Hrs		
Core Courses				Other Requirements				
MFG* H115 Safety in the Workplace			1					
MFG* H120 Metrology	2		3					
MFG* H124 Blueprint Reading I	3		2					
MFG* H126 Drafting	3		3					
MFG* H153 Manufacturing Machinery: Bench Work	1-5		2					
Prerequisites								
Total Other Credits Required to Issue Credential								

Other Details

Learning Outcomes - L.O. (Please list up to three of the most important student learning outcomes for the offering and concisely describe assessment methodologies to be used in measuring the outcomes. If the program will seek external accreditation or qualifies the completer to opt for a professional/occupational license, please frame outcomes in attention to such requirements.)

- 1. Explain and use machine and shop safety protocols, such as protecitve personal equipment, machine guarding, and lock out/tag out.
- 2. Select and use precision measuring devices, such as calipers, micrometers and pin gauges, to reliably and accurately measure parts.
- 3. Read and produce blueprints and technical drawings.
- 4. Develop a basic process plan, including layout, for a manually-formed part.
- 5. Select materials and use hand tools to scribe and manually form parts.

Each of these outcomes aligns with one, or both, of the NIMS Machining Level I Certifications in Measurement, Materials and Safety, or Job Planning, Benchwork and Layout. Assessment methodologies will include ToolingU module completion and written exams for all courses. Bench work skills will be assessed by project completion graded via rubric. Drafting skills will be assessed by the production of technical drawings. Metrology skills will be assessed by students demonstrating the ability to use precision measuring tools during the course and in practicals.