

Office of the Provost

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interofficeMEMORANDUM


DATE: November 11, 2016

TO: Rosemary Drohan

FROM: Antonio Moreira, Ph.D. 
Vice Provost for Academic Affairs

SUBJECT: UDC Cybersecurity (from CSEE)

Attached please find the original proposal for the UDC in Cybersecurity from Computer Science and Electrical Engineering. This proposal will be submitted simultaneously to USM and MHEC as per external procedures for these cases. For the sake of expediency, I am also sending copies of this information simultaneously to the Faculty Senate, the Undergraduate Council and the Academic Planning and Budget Committee. Please coordinate with Drs. Moffitt, McDonough and Nicholas to obtain the endorsement from the shared governance process.

We look forward to receiving the Faculty Senate's review.

Thank you.

AM:slm
Attachment

Cc: Dr. Kimberly Moffitt, President, Faculty Senate
Dr. Susan McDonough, Chair, Undergraduate Council
Dr. Patrice McDermott, Vice Provost for Faculty Affairs
Dr. Charles Nicholas, Chair, APB
Ms. Beth Wells (w/o attachment)

Proposed New Academic Plan or Name Change to Existing Academic Plan

Required steps in the review and approval process for proposed new academic plans and name changes to existing academic plans vary depending upon a number of factors. The Provost's Office reviews each concept for a new academic plan or name change in light of UMBC campus governance procedures and USM/MHEC approval guidelines. As a result of this examination, the boxes checked on page 2 of this form reflect the steps that have been identified as required for review of the proposed new academic plan or name change of an existing academic plan shown below and attached.

Concept approved by the Program Concept Group: UDC Cybersecurity (from CGEE) Date of PCG review: 3/7/16 Date routing sheet sent: 3/10/16

This routing form and process is designed to enable more effective and efficient tracking of documents throughout the review and approval steps, ultimately leading to more timely completion of the process. This is especially important because in many cases MHEC has strict "windows" during which proposals must be submitted.

Instructions:

1. Please do not detach this routing slip from the proposal.
2. Regarding the proposed program acronym, the department proposing the new academic plan is responsible to consult simultaneously by email with Pam Hawley in the Registrar's Office at mcinnis@umbc.edu and Michael Dillon in IRADS at midillon@umbc.edu. Please send the proposed program acronym, type (BA, BS, certificate, etc) and description. If you have no preferred acronym, you can send only the description and degree type; Pam and Michael will respond with an assigned acronym. After this consultation, insert the following below: (1) the proposed name of the new academic plan; (2) a formal description of the proposed new academic plan (up to 30 characters); (3) a short description of the proposed new academic plan (up to 10 characters); and (4) a proposed new 4-letter acronym for the proposed new academic plan.¹
3. If a new program is proposed, please send an email to Miriam Tillman at mir@umbc.edu to inquire whether the Marketing Department in Institutional Advancement has an interest in exploring marketing opportunities associated with this program.
4. The proposal and these routing sheets should be sent to each office indicated on this form, in the order in which each appears on the list.
5. Attach letters of support from all participating departments, assuring capacity in courses, etc.

As you sign your approval (or return it to the prior step for modification), please email Susan Mocko in the Provost's Office at mocko@umbc.edu, giving the name of the proposal as shown above and the office to which you are sending it next, so that we can keep track of it. If you have questions about the review process, please contact Beth Wells at bwells@umbc.edu, x 58907. Thank you very much for your assistance.

Proposed name of proposed new academic plan: _____ Proposed program acronym: _____

Proposed formal description of new proposed academic plan (up to 30 characters): _____

Proposed short description of proposed new academic plan (up to 10 characters): _____

OR

Proposed change to name of existing academic program: _____ Current program acronym:² _____

Additional instructions for proposal:
Follow the instructions in the new program guidelines on the Provost's website for program type: _____
Beth Wells
Assistant Vice Provost for Academic Affairs

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¹ Note that academic plan acronyms are permanent and, once established do not change in the future if the name of the academic plan changes.

² See footnote 1

Name of proposed new academic plan or proposed change to name of existing academic plan:

UDC Cybersecurity (from CSEB)

- Department proposing program must submit the proposal for informal review to the Vice-Provost for Academic Affairs, prior to submitting it for formal review.
- Department proposing program must develop and get approval for proposed acronym. Follow instruction # 2 on Page 1.
- USM requires that proposals be submitted electronically. Please send an electronic copy of the FINAL version of your proposal to Susan Mocko at smocko@umbc.edu.
- A Letter of Intent is required for this program. The format and directions will be sent to you electronically.

Send to this office if checked here.

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Signatures:

Barbara Wells
INFORMAL REVIEW
 Assistant Vice-Provost for Academic Affairs

Dates:

10/20/14
 Date reviewed

AF Mocko
 Department Chair
George C. Pelroy
 Vice-President for Administration & Finance

10/21/2016
 Date approved

10/24/16
 Date budget reviewed

Vice Provost, Professional Education

Date approved

Dean of Natural & Mathematical Sciences

Date approved

Dean of Arts, Humanities & Social Sciences

Date approved

Dean of the Erickson School

Date approved

Dean of Engineering & IT

Date approved

Dean of Undergraduate Education

11/5/16
 Date approved

Dean of Graduate Education

Date approved

Please return proposal & cover sheet at this point to:
 Vice Provost for Academic Affairs

Date Letter of Intent sent to USM

Chair, Undergraduate Council

Date approved

Chair, Graduate Council

Date approved

Chair, Academic Planning & Budget

Date approved

President, Faculty Senate

Date approved

Please return proposal & cover sheet at this point to:
 Vice Provost for Academic Affairs

Provost

Date approved

President

Date approved

University System of Maryland/
 Board of Regents
 and
 Maryland Higher Education Commission for

administrative review

Target MHEC Window submission date (subject to change) _____

Proposed Upper-Division Undergraduate Certificate in Cybersecurity

UMBC Department of Computer Science and Electrical Engineering

UMBC's mission includes preparing academically-talented students to be a part of the workforce of the state of Maryland, especially in STEM areas. The Strategic plan for the University, as well as the College of Engineering and Information Technology, call out security as one of the areas of strengths and growth at UMBC. Maryland is a hub for Cybersecurity, and the shortage of trained professionals in the cyber industry is well documented¹. BLS estimates² that this area has the top concentration of cybersecurity jobs, and their median pay is over \$100,000.

Cybersecurity as a field is very broad, and universities have found it challenging to design effective undergraduate major programs that include the required prerequisite and any level of depth in specific security-related topics. We propose creating a certificate in *Cybersecurity* within the Department of *Computer Science and Electrical Engineering (CSEE)* focused on the technical elements of cybersecurity. Students pursuing the Cybersecurity UDC at UMBC will mostly be majors from *computer science (CS)* or *computer engineering (CE)*. It will take students who have the technical background in computing and allow them to take a series of electives to learn about, and document their mastery in, the theory, fundamental, tools, and techniques of cybersecurity.

The UDC will add value to a student's degree or resume, and make them more marketable by documenting their depth and breadth of knowledge in technical elements such as network security, cryptography, malware analysis, policy in the cybersecurity area. The program is of high academic quality with significant technical breadth and experiential learning requirements. Given the very significant demand in the local area and nationally for students qualified in this specialty, this will be a clear win for the students and make their UMBC degree more attractive. The UDC also signals to the public UMBC's strength and opportunities in this area of specialty. Cybersecurity is a very wide umbrella that covers topics and skills in many different areas. Thus, we believe having multiple cybersecurity offerings at UMBC and in the state best serves the needs of students and the industry.

The design of the UDC will limit it, except in rare cases, to CS and CE majors. Anecdotally, interest in this UDC among current majors is very high. Most of the security-related courses offered by the department are full and have waitlists. Interest is fueled by the well-publicized availability of jobs, and the national need for graduates trained in this area, as evidenced by a gift of over \$ 2 million from Northrop Grumman to UMBC to create a Scholars Program in Cybersecurity. The gift also funds a number of outreach activities meant to generate interest in cybersecurity among current students, community college students, and high school students.

Proposed curriculum (15 credits total)

Core courses: CMSC 426 Principles of Computer Security (3)
CMSC 421 Operating Systems (3)

Electives (choose three from a list, for nine credits): The List will be maintained by the department. Courses currently on the list include (each 3 credits): CMSC 443 Cryptography and Data Security; CMSC 487 Network Security; CMSC 491 Mobile/Wireless Security; CMSC 481 Networking; CMSC 491 Malware Analysis; CMSC 491 Reverse Engineering; and CMSC 442 Coding Theory.

Experiential Learning: Students must also demonstrate experiential learning by one of a variety of means -- take a cybersecurity-related course with a significant project component; do a cybersecurity related project in the CE Capstone; complete and document an internship; complete and document a practical research project as an independent study with a CSEE faculty member; or document significant professional or life experience.

The courses needed for the certificate are regularly taught by tenure track, lecturer, and adjunct faculty and professor of practice in the department. Oversight is provided by the departmental undergraduate committee and the Undergraduate Program Director. There is also interest from the faculty to create new courses in the security area. The resources for offering this program therefore exist in the department and current staffing is sufficient.

¹ <http://burning-glass.com/research/cybersecurity/>

² <http://www.bls.gov/oes/current/oes151122.htm>