BOARD OF REGENTS

SUMMARY OF ITEM FOR ACTION,
INFORMATION OR DISCUSSION

TOPIC: University of Maryland University College Substantial Modification of the Bachelor's of Technical/Professional Studies (BTPS) in Biotechnology and the BTPS in Laboratory Management

COMMITTEE: Education Policy

DATE OF COMMITTEE MEETING: March 16, 2011

SUMMARY: COMAR defines the Bachelor's of Technical/Professional Studies as "…a degree awarded for the successful completion of an A.A.S. degree, an advanced program of study in the designated area of concentration, and a 12-credit internship or field placement related to the program of study." (13B.02.03.02)

The proposed modification of the existing BTPS degree programs in Biotechnology and Laboratory Management would establish Bachelor of Science alternatives for both programs. This modification is necessary to provide access to students who have completed the appropriate lower-level transfer coursework but have not earned the A.A.S. degree and who therefore do not qualify under the current BTPS degree structure. Other than eliminating the requirement that entering students must hold the A.A.S. degree, the proposed B.S. degrees would have the same curricular requirements as the current BTPS programs.

The proposal is aligned with the Maryland State Plan for Postsecondary Education and with initiatives to increase the number of graduates in STEM fields. The proposal also supports the national and state goal of increasing the rate of degree attainment among adults.

ALTERNATIVE(S): The Regents may not approve the program or may request further information.

FISCAL IMPACT: There is no fiscal impact.

CHANCELLOR'S RECOMMENDATION: That the Committee on Education Policy recommend that the Board of Regents approve the proposal from University of Maryland University College to offer the Bachelor of Science in Biotechnology and the Bachelor of Science in Laboratory Management.

COMMITTEE RECOMMENDATION:	Approval.	DATE: March 16, 2011
BOARD ACTION:		DATE:

SUBMITTED BY: Irwin Goldstein (301) 445-1992 irv@usmd.edu

University of Maryland University College
Office of the Provost

February 18, 2011

Dr. Elisabeth A. Sachs
Interim Secretary
Maryland Higher Education Commission
839 Bestgate Rd., Suite 400
Annapolis, MD 21401

Dear Dr. Sachs:

Attached is a pair of proposals from University of Maryland University College (UMUC) for a substantive modification of the existing Bachelor of Technical and Professional Studies (BTPS) degrees in Biotechnology (HEGIS 049901, CIP 269999) and Laboratory Management (HEGIS 490024, CIP 520299). In accordance with the Code of Maryland Regulations (COMAR Section 13B.02.03.33), these two BTPS programs are currently designed as articulated degrees for transfer students who have earned the Associate in Applied Science (AAS) in a related area at a community college. The proposed substantive modification would provide an alternate track toward a Bachelor of Science in Biotechnology or in Laboratory Management that would be accessible to students who have completed the appropriate lower-level transfer coursework but have not earned the AAS degree.

If approved by the Maryland Higher Education Commission and the Board of Regents of the University System of Maryland, the new pathways to the BS will be implemented in the Fall 2011 semester. We suggest that the new BS degrees would bear the same CIP codes as the original BTPS programs.

The proposed alternate degree structure will provide opportunities to earn a bachelor's degree in Biotechnology or Laboratory Management to students who have completed the appropriate lower-level transfer coursework but have not earned an AAS and who therefore do not qualify under the current BTPS degree structure. The proposal is in aligned with the goals of the Maryland State Plan for Postsecondary Education and with initiatives to increase the number of graduates in STEM fields. The proposal also supports the national and state goal of increasing the rate of degree attainment among adults.

We very much look forward to adding the new Bachelor of Science options to our degree offerings. If you have any questions or need additional information about the proposed program, please feel free to contact me.

Sincerely,

Greg Von Lehmen

Greg von Lehmen, Ph.D.
Provost

cc: Dr. Irwin Goldstein

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UNIVERSITY SYSTEM OF MARYLAND INSTITUTION PROPOSAL FOR

____	New Instructional Program
X	Substantial Expansion/Major Modification
____	Cooperative Degree Program
X	Within Existing Resources or
____	Requiring New Resources

University of Maryland University College
Institution Submitting Proposal

Biotechnology
Title of Proposed Program

Bachelor of Science or Bachelor of Technical and Professional Studies	**Fall 2011**
Degree to be Awarded	Projected Implementation Date
049901	**269999**
Proposed HEGIS Code	Proposed CIP Code
School of Undergraduate Studies	**Marie Cini, Vice President and Dean**
Department in which program will be located	Department Contact
240-684-2800	**mcini@umuc.edu**
Contact Phone Number	Contact E-Mail Address
Greg Von Kuhlmann	**2/18/11**
Signature of President or Designee	Date

University of Maryland University College
BS/BTPS in Biotechnology

Institutional Mission

The mission of University of Maryland University College (UMUC) is to offer top-quality educational opportunities to adult students in Maryland, the nation, and the world, setting the global standard of excellence in adult education. By offering academic programs that are respected, accessible, and affordable, UMUC broadens the range of career opportunities available to students, improves their lives, and maximizes their economic and intellectual contributions to Maryland and the nation.

In support of adult students in a global environment, UMUC serves a very large number of transfer students; in fact more than 50% of UMUC students are transfers from other institutions. These include military students deployed around the world, community college graduates, and other students with substantial amounts of credit from other institutions because of their nontraditional patterns of enrollment and educational progress. All of UMUC's degrees are designed to accommodate transfer credit and UMUC conducts active outreach and support for students completing community college degrees.

UMUC currently offers the Bachelor of Technical and Professional Studies (BTPS) degrees in Biotechnology (HEGIS 049901, CIP 269999) and Laboratory Management (HEGIS 490024, CIP 520299). In accordance with the Code of Maryland Regulations (COMAR Section 13B.02.03.33), these two BTPS programs are specifically designed as articulated degrees for transfer students who have earned the Associate in Applied Science (AAS) in a related area at a community college. This proposal is one of a set of two through which UMUC proposes to create alternate tracks toward a Bachelor of Science in Biotechnology and in Laboratory Management that would be accessible to students who have not earned the AAS degree.

Rationale and Need for the Proposed Modification

UMUC was one of the first universities in Maryland to offer the BTPS, beginning with the BTPS in Biotechnology in 2004. UMUC has articulated this program with four community colleges in Maryland, and also with out-of-state community colleges, including Northern Virginia Community College.

As required by COMAR (Section 13B.02.03.33), the BTPS is specifically defined as an articulated degree, requiring completion of an AAS degree, an internship in the field, and advanced study at the senior institution. Thus the BTPS in Biotechnology is limited to students who have received an Associate of Applied Science degree from a community college with whom UMUC has an articulation agreement. The articulated design calls for students to obtain their scientific background from courses in the associate's degree including genetics, biotechnology techniques, and general microbiology. In continuing at UMUC, students complete the remaining requirements for the bachelor's degree, including advanced study in biology and an internship.

In keeping with its mission, UMUC welcomes the opportunity to provide pathways for community college students, including those who may face obstacles to continuation. UMUC supports the goals of the BTPS and finds the articulated design particularly appropriate in science and technology fields, since we do not have the facilities for extensive science laboratory coursework. Despite the fact that UMUC has formal articulations with several community colleges for these degrees, our experience with the BTPS suggests that the structure mandated for the degree is itself an obstacle for many students.

The requirements for the BTPS allow it to be offered only to students who have earned the AAS degree. Although many community colleges offer an appropriate curriculum for articulation, the degree conferred may be an Associate of Science (AS) or Associate of Arts (AA) degree, rather than an AAS, even though the curriculum may be essentially the same as for AAS degrees at other institutions. Among the ineligible programs are the AA degrees in Biotechnology at the College of Southern Maryland and at Howard Community College, and the AA and AS degrees in Biotechnology from Miami Dade College in Florida, with whom UMUC has an alliance agreement for other programs.

UMUC continually receives requests from both individual students and from institutions for BTPS articulation to degree programs that have relevant curricula, but which are ineligible under the COMAR definition for the BTPS. Other students may have changed institutions or majors, acquiring a combination of credits from transfer work and may not have earned an articulated AAS, but have completed the appropriate coursework or have the willingness to complete that coursework at a community college. For example, Montgomery College has students in other science-related fields who have developed an interest in biotechnology and are pursuing the Lower-Division Certificate in Biotechnology with an interest, were they eligible, in continuing for the four-year Biotechnology BTPS degree.

The specificity of the BTPS degree requires that UMUC reject such students even though they have the appropriate background and preparation and would benefit from a bachelor's degree. This includes students from both in and outside of Maryland who would be able to complete the four-year degree onsite or online through UMUC. Confining eligibility for the BTPS to those students who have earned the AAS is unduly limiting to the transfer and completion options for other students, since it eliminates their credentials from consideration.

For this reason, UMUC requests approval to offer a BS degree in Biotechnology with the same requirements as the existing BTPS degrees. UMUC does not propose eliminating the BTPS degree, but instead proposes adding the option of a Bachelor of Science degree, based on the same curricular requirements, but available to students who hold an AA, an AS, or the same required lower-level courses in transfer combinations. It would be explained through admission materials and academic advisement that a student holding the AAS is eligible for the BTPS degree and one who earned the AS or AA would instead be eligible to study toward the BS degree.

UMUC's intention is not to expand the scope of the degree beyond the current two-year completion model; that is, we do not intend to offer the first two years of coursework toward the BTPS or BS. UMUC does not have the capacity to offer the requisite laboratory science courses

for a science or technical degree. UMUC will also continue to support the achievement of the associate degree and does not plan to market the proposed BS to students who do not earn an associate degree. UMUC does, however, wish to accommodate adult students who enter UMUC with complicated and varied transfer patterns.

Other than eliminating the requirement that entering students must hold the AAS degree, the proposed BS degree would have the same curricular requirements as the current BTPS. These current requirements include 15 semester hours of lower-level coursework in genetics, microbiology and biotechnology techniques, and an additional 17 semester hours in related science coursework from the community college, to be supplemented by 21 semester hours in advanced coursework and an internship at UMUC. The degree requirements would indicate that the availability of the BTPS or the BS depends on the associate-level credentials of the student, with the AAS degree leading to the BTPS and the AA or AS leading to the BS.

Characteristics of the Program

Catalog Description of the Proposed Program

The biotechnology major is offered through an articulated transfer program, building on the technical and scientific knowledge gained through the associate's degree program and direct experience in the field. It combines laboratory skills and applied coursework with a biotechnology internship experience and upper-level study. The biotechnology curriculum covers general biological and chemical sciences, biotechniques, bioinstrumentation, bioinformatics, microbiology, molecular biology, and cell biology.

Student Learning Outcomes

The student who graduates with a major in biotechnology will be able to:

- Practice ethical standards of integrity, honesty, and fairness in scientific practices and professional conduct.
- Communicate orally and in writing in a clear, well-organized manner that effectively informs and clarifies scientific principles and lab techniques to staff and stakeholders.
- Offer technical support, customer assistance, and cost/benefit analyses in the application of biotechnical approaches to the development of products and services.
- Use scientific procedures and current and emerging technologies to conduct safe and hygienic laboratory experiments and to collect data that are appropriately validated and documented.
- Comply with and adhere to national, state, and local standards, policies, protocols, and regulations for laboratory and manufacturing activity.
- Develop an action plan that includes the continuous pursuit of education, training, and research to keep current on biotechnology practices and trends for personal and professional development.
- Apply scientific knowledge and principles, quantitative methods, and technology tools to think critically and solve complex problems in biotechnology.

Degree Requirements

The curriculum for the proposed BS is identical to that for the existing BTPS degree. No new courses will be required for the implementation of the proposed BS.

Degree Requirements	**120 semester hours**
Major Requirements	**36 semester hours**
Required courses from the community college: General microbiology with lab, general genetics with lab, biotechnology techniques (Specific courses determined in articulation with the collaborating community college)	15
BIOL 325	3
BIOL 350 Molecular and Cellular Biology	3
BIOL 400 Life Science Seminar	3
BIOL 486A/486B Internship through Cooperative Education	6
One biological applications course chosen from BIOL 320 Forensic Biology BIOL 334 Vaccines and Society BIOL 357 Bioinformatics Or an additional approved internship	3
One specialized topics course chosen from: BIOL 356 Molecular Biology Laboratory BIOL 360 Developmental Biology BIOL362 Neurobiology BIOL422 Epidemiology of Emerging Infections BIOL 434 General Virology BIOL 438 Immunology NSCI 301 Laboratory Organization and Management	3
General Education Requirements	**41**
WRTG 101 Principles of English Composition	3
Additional writing/communication coursework	9
MATH 107 College Algebra	3
Arts & Humanities	6
Social Sciences	6
Sciences + Lab* From collaborating community college, coursework from areas detailed below	7
Computing	6
LIBS 150 Information Literacy and Research Methods	1
***Additional Required Community College Coursework**: Selected from biotechnology, biochemistry, cell biology, chemistry, genetics, immunology, microbiology, molecular biology, physics, virology (Specific coursework determined in articulation with the collaborating community college. Seven additional science credits applied to science General Education Requirements listed above, as appropriate.)	**10**
Minor and/or Electives	**33**

Financial and Other Resources

UMUC will require no new funds to develop and launch the proposed program. The proposed modification will not require the development of any new courses. Current faculty will continue to teach the existing courses.

UNIVERSITY SYSTEM OF MARYLAND INSTITUTION PROPOSAL FOR

____	New Instructional Program
X	Substantial Expansion/Major Modification
____	Cooperative Degree Program
X	Within Existing Resources or
____	Requiring New Resources

University of Maryland University College
Institution Submitting Proposal

Laboratory Management
Title of Proposed Program

Bachelor of Science or Bachelor of Technical and Professional Studies
Degree to be Awarded

Fall 2011
Projected Implementation Date

490024
Proposed HEGIS Code

520299
Proposed CIP Code

School of Undergraduate Studies
Department in which program will be located

Marie Cini, Vice President and Dean
Department Contact

240-684-2800
Contact Phone Number

mcini@umuc.edu
Contact E-Mail Address

Greg Van Fulmer
Signature of President or Designee

2/18/11
Date

University of Maryland University College
BS/BTPS in Laboratory Management

Institutional Mission

The mission of University of Maryland University College (UMUC) is to offer top-quality educational opportunities to adult students in Maryland, the nation, and the world, setting the global standard of excellence in adult education. By offering academic programs that are respected, accessible, and affordable, UMUC broadens the range of career opportunities available to students, improves their lives, and maximizes their economic and intellectual contributions to Maryland and the nation.

In support of adult students in a global environment, UMUC serves a very large number of transfer students; in fact more than 50% of UMUC students are transfers from other institutions. These include military students deployed around the world, community college graduates, and other students with substantial amounts of credit from other institutions because of their nontraditional patterns of enrollment and educational progress. All of UMUC's degrees are designed to accommodate transfer credit and UMUC conducts active outreach and support for students completing community college degrees.

UMUC currently offers the Bachelor of Technical and Professional Studies (BTPS) degrees in Biotechnology (HEGIS 049901, CIP 269999) and Laboratory Management (HEGIS 490024, CIP 520299). In accordance with the Code of Maryland Regulations (COMAR Section 13B.02.03.33), these two BTPS programs are specifically designed as articulated degrees for transfer students who have earned the Associate in Applied Science (AAS) in a related area at a community college. This proposal is one of a set of two through which UMUC proposes to create alternate tracks toward a Bachelor of Science in Biotechnology and in Laboratory Management that would be accessible to students who have not earned the AAS degree.

Rational and Need

University of Maryland University College (UMUC) currently offers the Bachelor of Technical and Professional Studies (BTPS) degree in Laboratory Management, and has articulated this program with four community colleges in Maryland.

As required by COMAR (Section 13B.02.03.33), the BTPS is specifically defined as an articulated degree, requiring completion of an AAS degree, an internship in the field, and advanced study at the senior institution. Thus the BTPS in Laboratory Management is limited to students who have received an Associate of Applied Science degree from a community college with whom UMUC has an articulation agreement. The articulated design calls for students to obtain their scientific background from courses in the associate's degree in areas such as biology, biochemistry, biotechnology, chemistry, microbiology, and molecular biology. In continuing at UMUC for the bachelor's degree, they complete the remaining requirements for the bachelor's degree, including a seminar in life science and an internship as well as study in management and communication.

In keeping with its mission, UMUC welcomes the opportunity to provide pathways for community college students, including those who may face obstacles to continuation. UMUC supports the goals of the BTPS design and find it particularly appropriate in science and technology fields since we do not have the facilities for extensive science laboratory coursework. Despite the fact that UMUC has formal articulations with several community colleges for these degrees, our experience with the BTPS suggests that the structure mandated for the degree is itself an obstacle for many students.

The requirements for the BTPS allow it to be offered only to students who have earned the AAS degree. Although many community colleges offer an appropriate curriculum for articulation, the degree conferred may be an Associate of Science (AS) or Associate of Arts (AA) degree, rather than an AAS, even though the curriculum may be essentially the same as for AAS degrees at other institutions. Among the ineligible programs are the AA degrees in Biotechnology at the College of Southern Maryland and at Howard Community College, and the AA and AS degrees in Biotechnology from Miami Dade College in Florida, with whom UMUC has an alliance agreement for other programs.

UMUC also regularly receive requests from students receiving AS degrees in biology and other sciences who wish to pursue a career in laboratory management, as well as requests from students who have changed majors or transferred between institutions, and so have the appropriate lower-level coursework to articulate but have not earned the specific AAS degree.

The specificity of the BTPS degree requires that UMUC reject such students even though they have the appropriate background and preparation and would benefit from a bachelor's degree. This includes students from both in and outside of Maryland who would be able to complete the four-year degree onsite or online through UMUC. Confining eligibility for the BTPS to those students who have earned the AAS is unduly limiting to the transfer and completion options for other students, since it eliminates their credentials from consideration.

For this reason, UMUC requests approval to offer a BS degree in Laboratory Management with the same requirements as the existing BTPS degrees. UMUC does not propose eliminating the BTPS degree, but instead proposes adding the option of a Bachelor of Science degree, based on the same curricular requirements, but available to students who hold an AA, an AS, or the same required lower-level courses in transfer combinations. It would be explained through admission materials and academic advisement that a student holding the AAS is eligible for the BTPS degree and one who earned the AS or AA would instead be eligible to study toward the BS degree.

UMUC's intention is not to expand the scope of the degrees beyond the current two-year completion model; that is, we do not intend to offer the first two years of coursework toward the BTPS or BS. UMUC does not have the capacity to offer the requisite laboratory science courses for a science or technical degree. UMUC will also continue to support the achievement of the associate degree and does not plan to market the proposed BS to students who do not earn an associate degree. UMUC does, however, wish to accommodate adult students who enter UMUC with complicated and varied transfer patterns.

Other than eliminating the requirement that entering students must hold the AAS degree, the proposed BS degree would have the same requirements as the current BTPS degree. These current requirements include 15 semester hours of lower-level foundational coursework in the laboratory sciences, and an additional 14 to 22 semester hours in related science coursework from the community college, to be supplemented by 21 semester hours in advanced coursework and internship at UMUC. The degree requirements would indicate that the availability of the BTPS or the BS depends on the associate-level credentials of the student, with the AAS degree leading to the BTPS and the AA or AS leading to the BS.

Characteristics of the Program

Catalog Description of the Proposed Program

The laboratory major prepares students to manage and coordinate the nontechnical activities that contribute to a safe and well-run laboratory. It is designed as an articulated program, building on the technical and scientific knowledge gained through the associate's degree program and direct experience in the field. The curriculum provides both in-depth study of scientific concepts and procedures and management skills related to inventory, budget, personnel, and operations.

Student Learning Outcomes

The student who graduates with a degree in laboratory management will be able to:

- Create a healthy, safe, and productive workplace by effectively and appropriately hiring, training, supporting, and evaluating laboratory personnel.
- Manage (plan, organize, and direct) the daily work activities of a laboratory setting by working independently and as a member of a team, meeting job expectations, and adhering to organizational policies and goals.
- Communicate orally and in writing in a clear, well-organized manner that effectively persuades, informs, and clarifies ideas, information, and lab techniques/procedures to staff, the scientific community, and the public.
- Practice ethical standards of integrity, honesty, and fairness as a laboratory manager and professional.
- Monitor and maintain laboratory-related documentation, equipment, and supplies necessary for conducting efficient, safe, cost-effective, and hygienic laboratory operations.
- Manage scientific and laboratory practices and procedures by complying with and adhering to national, state, and local standards, policies, protocols, and regulations.

Degree Requirements

The curriculum for the proposed BS is identical to that for the existing BTPS degree. No new courses will be required for the implementation of the proposed BS.

Degree Requirements	120 semester hours
Major Requirements	**36 semester hours**
Required courses from the community college: Biology, biochemistry, biotechnology , chemistry, microbiology, and/or molecular biology courses (Specific courses determined in articulation with the collaborating community college)	15
BIOL 325 Inquiries in Biological Science	3
BIOL 400 Life Science Seminar	3
BMGT 364 Management and Organization Theory	3
NSCI 301 Laboratory Organization and Management	3
Course chosen from: BMGT 317 Problem Solving for Managers BMGT 487 Project Management I COMM 300 Communication Theory IFSM 300 Information Systems in Organizations SPCH324 Communication and Gender SPCH 397 Organizational Presentations SPCH 426 Negotiation and Conflict Management SPCH 470 Listening SPCH 482 Intercultural Communication	3
BIOL 486A/486B Internship through Cooperative Education (in biology or other related area)	6
General Education Requirements	**41**
WRTG 101 Principles of English Composition	3
Additional writing/communication coursework	9
MATH 107 College Algebra	3
Arts & Humanities	6
Social Sciences	6
Sciences + Lab From collaborating community college, coursework from areas detailed below*	7
Computing	6
LIBS 150 Information Literacy and Research Methods	1
***Additional Required Community College Coursework**: Selected from science and lab science coursework (Specific coursework determined in articulation with the collaborating community college. Seven additional science credits applied to science GER above as appropriate.)	**7-14**
Minor and/or Electives	**22-29**

Financial and Other Resources

UMUC will require no new funds to develop and launch the proposed program. The proposed modification will not require the development of any new courses. Current faculty will continue to teach the existing courses.