



AN ARTICULATION AGREEMENT BETWEEN
ST. PETERSBURG COLLEGE ENGINEERING TECHNOLOGY
DEPARTMENT'S
BIOMEDICAL ENGINEERING TECHNOLOGY BMET-AS PROGRAM
&
ST. PETERSBURG COLLEGE WORKFORCE INSTITUTE

DEVELOPED THROUGH

TAACCCT-COMMUNITY COLLEGE CONSORTIUM FOR
BIOSCIENCE CREDENTIALS GRANT-(MEDICAL DEVICES)



Submitted by: Lara L Sharp, Program Director

INTRODUCTION

Purpose

To provide non-credit to credit articulation of courses developed through funding from the U.S. Department of Labor Trade Adjustment Assistance to Community College Consortiums grant via nontraditional learning experiences and according to BOT rule 6HX23-4.17.

SACS COMPLIANCE

SACS Policy

3.4.4. - The institution has a defined and published policy for evaluating, awarding, and accepting credit for transfer, experiential learning, advanced placement, and professional certificates that is consistent with its mission and ensures that course work and learning outcomes are at the collegiate level and comparable to the institution's own degree programs. The institution assumes responsibility for the academic quality of any course work or credit recorded on the institution's transcript. - Source: <http://www.sacscoc.org/pdf/2008PrinciplesofAccreditation.pdf>

SPC BOT rule 6HX23-4.17

Credit may be awarded under this area for learning in a discipline or program area(s) offered by the College. The assessment of learning shall take place through means consistent with generally accepted techniques of measuring college-level learning. The techniques may include written and oral examinations, portfolio evaluations, interview assessments, and project or product evaluations.

Curriculum

Is comparable to St. Petersburg College's Biomedical Engineering Technology courses as evaluated by credentialed faculty at St. Petersburg College.

Assessment

- An proctored assessment, created by a credentialed faculty member, will be taken upon successful completion of the non-credit course

References

SACS credentialed institutions using credit by examination in compliance of SACS policy 3.4.4.

- Hillsborough Community College
- College of Central Florida
- Western Texas College
- Southwestern Community College
- Northeastern Technical College
- Stanly Community College
- Wayne Community College
- Valencia Community College

PROGRAM DETAILS

1. Students will be program participants of the U.S. Department of Labor TAACCCT Biosciences grant funded Medical Devices/Biomedical Technology program as provided through SPC Workforce Institute. Other persons who may benefit from this agreement include
2. Students must enroll at the College in an appropriate Associate of Science degree program.
3. Upon successful completion of the non-credit course, a SPC Biomedical Engineering Technology credentialed faculty will proctor an assessment equivalent to the assessment given in the credit course.
4. Students will be awarded up to 14 credit hours of academic credit for completion of the equivalent 224 non-credit contact hours upon successful completion of the training program and competency exams, and after application to SPC as a degree or certificate seeking student. TAACCCT grant students will not be charged any fees for the awarding of hours covered by this agreement; however, if a non-TAACCCT grant WI student wishes to transfer credit to the BMET-AS program, fees will apply according to College policy. A grade of "P" will be given for the college credit.

Figure 1: Course Articulations

Biomedical Devices- Workforce Institute Training		WI training hours	Credits to be Awarded	Biomedical Engineering Technology Credit Equivalent	
BMD0184	Basic Electronics	48	3	EET 1084C	Introduction to Electronics
BMD0214	Instrumentation	16	1	EET 1214C	Instrumentation and Control Systems
BMD0142	Biomedical Technology and Techniques	48	3	EET 1412C	Technology and Techniques
BMD0407	Survey of Biomedical Technology	48	3	ETS 1407	Survey of Medical Technology
BMD0175	Technical Support Fundamentals	32	2	CET 1175C	Technical Support Fundamentals
BMD0108	Introduction to Biomedical Engineering	32	2	BME 1008	Introduction to Biomedical Engineering
Totals		224	14		

Figure 2: Course MLO Alignment

Biomedical Devices- Workforce Institute Training		Credits to be Awarded	Biomedical Engineering Technology Credit Equivalent	
BMD0184	Basic Electronics	3	EET 1084C	<p>Introduction to Electronics</p> <p>MLOs:</p> <ol style="list-style-type: none"> 1. The student will demonstrate an understanding of direct current (DC) circuits 2. The student will demonstrate an understanding of alternating current (AC) circuits 3. The student will demonstrate an understanding of semiconductor devices 4. The student will demonstrate an understanding of linear integrated circuits 5. The student will demonstrate an understanding of digital electronic circuits
BMD0214	Instrumentation	1	EET 1214C	<p>Instrumentation and Control Systems</p> <p>MLOs:</p> <ol style="list-style-type: none"> 1. Students will demonstrate competency in performing core skills needed for mathematical functions, scientific notations, logarithms, measurements and graphing 2. The student will demonstrate proficiency in troubleshooting basic electrical systems, use of test equipment, processes and electrical safety 3. The student will demonstrate proficiency in operating test equipment, repairing basic electrical systems and resolving patient safety issue 4. The student will demonstrate proficiency in electrical measurement, test equipment use, device troubleshooting and operation of patient simulation devices

BMD0142	Biomedical Technology and Techniques	3	EET 1412C	<p>Biomedical Technology and Techniques</p> <ol style="list-style-type: none"> 1. Students will be able to determine and follow identified safety procedures 2. The student will be able to install, operate and maintain biomedical equipment 3. The student will be able to apply their understanding of biomedical equipment in both a laboratory and hospital environment 4. The student will be able to practice a variety of healthcare technology management responsibilities including; equipment safety; inspection and maintenance procedures; troubleshooting and repair; medical device acceptance testing and incoming inspection
BMD0407	Survey of Biomedical Technology	3	ETS 1407	<p>Survey of Medical Technology</p> <ol style="list-style-type: none"> 1. Students will be able to describe historical events, technology and processes that have contributed to the development of medical devices 2. Students will be able to describe the main uses of medical technology in clinical settings 3. Students will be able to describe Federal and State regulations, requirements and issues related to medical devices 4. Students will be able to identify and classify both national and local producers of medical devices 5. Students will be able to define glossary terms for medical devices with their purpose, manufacturers, uses, and safety issues
BMD0175	Technical Support Fundamentals	2	CET 1175C	<p>Technical Support Fundamentals:</p> <ol style="list-style-type: none"> 1. Students will demonstrate competency by performing basic word processing tasks, demonstrating research skills utilizing online resources and presenting data and information in an appropriate manner

				<ol style="list-style-type: none"> 2. Students will identify features and demonstrate use of computer applications for technical support staff in a health care setting 3. Students will identify and use of specific databases needed for the documentation of medical device technology management 4. Students will demonstrate skills needed to search, organizing and enter information into databases 5. Students identify methods of data collection and performing basic data analysis for research, development, or manufacturing of biomedical application 6. Students will identify and demonstrate ability to use internet resources related to biomedical information systems 7. Students will identify document templates and use features of word processing applications for technical report writing 8. Students will research and perform needs analysis and complete process documentation 9. Students will demonstrate ability to recognize and effectively use customer service fundamentals needed for a hospital environment
BMD0108	Introduction to Biomedical Engineering	2	BME 1008	<p>Introduction to Biomedical Engineering</p> <p>MLOs:</p> <ol style="list-style-type: none"> 1. Students will demonstrate competency by performing basic word processing tasks, demonstrating research skills utilizing online resources and presenting data and information in an appropriate manner 2. The student will demonstrate knowledge of the history, impact and application of the field of biomedical engineering by recognizing, defining, summarizing and explaining key concepts, historical context and technology related to this field

BMET-AS and Workforce Institute Articulation Agreement

				<ol style="list-style-type: none"> 3. The student will demonstrate knowledge of key subdivisions of the Biomedical Engineering field through recognizing, differentiating, and explaining relevant biomedical technology and processes 4. The student will demonstrate detailed knowledge of significant scientific contributors and the impact of their research on biomedical engineering technology 5. The student will be able to identify the career opportunities within the field as well as the associated knowledge, skills and abilities (KSAs) required for employment
Maximum credits awarded		14		

Figure 3: Assessment Alignment

Biomedical Devices-Workforce Institute Training	Biomedical Engineering Technology Credit Equivalent		Assessment Questions (developed by an accredited SPC Biomedical Engineering Technology Instructor)											
<p>BMD0184</p> <p>Basic Electronics</p>	<p>EET 1084C</p>	<p>Introduction to Electronics</p> <p>MLOs:</p> <ol style="list-style-type: none"> 1. The student will demonstrate an understanding of direct current (DC) circuits 2. The student will demonstrate an understanding of alternating current (AC) circuits 3. The student will demonstrate an understanding of semiconductor devices 4. The student will demonstrate an understanding of linear integrated circuits 5. The student will demonstrate an understanding of digital electronic circuits 	<p>MLO</p>	<p>Question Number(s)</p> <table border="1"> <tr> <td>1</td> <td>1, 2, 3, 4, 6, 7, 8, 9, 10, 11, 12, 14, 17, 18, 32, 34, 35</td> </tr> <tr> <td>2</td> <td>6, 7, 8, 9, 10, 13, 15, 16, 19, 20, 23, 33, 36, 37, 38</td> </tr> <tr> <td>3</td> <td>38, 39,40,41,42</td> </tr> <tr> <td>4</td> <td>5, 21, 22</td> </tr> <tr> <td>5</td> <td>38, 47, 49, 50, 51, 52, 53</td> </tr> </table>	1	1, 2, 3, 4, 6, 7, 8, 9, 10, 11, 12, 14, 17, 18, 32, 34, 35	2	6, 7, 8, 9, 10, 13, 15, 16, 19, 20, 23, 33, 36, 37, 38	3	38, 39,40,41,42	4	5, 21, 22	5	38, 47, 49, 50, 51, 52, 53
1	1, 2, 3, 4, 6, 7, 8, 9, 10, 11, 12, 14, 17, 18, 32, 34, 35													
2	6, 7, 8, 9, 10, 13, 15, 16, 19, 20, 23, 33, 36, 37, 38													
3	38, 39,40,41,42													
4	5, 21, 22													
5	38, 47, 49, 50, 51, 52, 53													
<p>BMD0214</p> <p>Instrumentation</p>	<p>EET 1214C</p>	<p>Instrumentation and Control Systems</p> <p>MLOs:</p> <ol style="list-style-type: none"> 1. Students will demonstrate competency in performing core skills needed for 	<p>MLO</p>	<p>Exam</p> <table border="1"> <tr> <td>1</td> <td> <ul style="list-style-type: none"> • 20,21,22,23,28,29,30,31,32,33,34 </td> </tr> <tr> <td>2</td> <td> <ul style="list-style-type: none"> • 1,2,3,4,5,6,10,11,12,13,24,25,26 </td> </tr> </table>	1	<ul style="list-style-type: none"> • 20,21,22,23,28,29,30,31,32,33,34 	2	<ul style="list-style-type: none"> • 1,2,3,4,5,6,10,11,12,13,24,25,26 						
1	<ul style="list-style-type: none"> • 20,21,22,23,28,29,30,31,32,33,34 													
2	<ul style="list-style-type: none"> • 1,2,3,4,5,6,10,11,12,13,24,25,26 													

		<p>mathematical functions, scientific notations, logarithms, measurements and graphing</p> <ol style="list-style-type: none"> The student will demonstrate proficiency in troubleshooting basic electrical systems, use of test equipment, processes and electrical safety The student will demonstrate proficiency in operating test equipment, repairing basic electrical systems and resolving patient safety issue The student will demonstrate proficiency in electrical measurement, test equipment use, device troubleshooting and operation of patient simulation devices 	<p>3</p> <p>4</p>	<ul style="list-style-type: none"> 2,3,4,5,6,10,11,12,24,25,26 2,4,12,24,25,26,
<p>BMD0142</p> <p>Biomedical Technology and Techniques</p>	<p>EET 1412C</p>	<p>Biomedical Technology and Techniques</p> <ol style="list-style-type: none"> Students will be able to determine and follow identified safety procedures The student will be able to install, operate and maintain biomedical equipment The student will be able to apply their understanding of biomedical equipment in both a laboratory and hospital environment The student will be able to practice a variety of healthcare technology management 	MLO	Exam
			1	MC-1,9,10,17,22,29,30, SA-4,5,9,10 Essay-2
			2	MC-2,6,12,13,14,15,16,18,19,20,23 SA-3,8,9 Essay-1,3
			3	MC-3,5,7,8,25,26,27 SA-1,2,7 Essay-4

		responsibilities including; equipment safety; inspection and maintenance procedures; troubleshooting and repair; medical device acceptance testing and incoming inspection	4	MC- 2,6,7,8,9,10,11,16,17,18,19,20,2 1,22,23,24,25,26,27 SA-3,4,5,6,9,10 Essay-1,2,3,4
BMD0407 Survey of Biomedical Technology	ETS 1407	Survey of Medical Technology 1. Students will be able to describe historical events, technology and processes that have contributed to the development of medical devices 2. Students will be able to describe the main uses of medical technology in clinical settings 3. Students will be able to describe Federal and State regulations, requirements and issues related to medical devices 4. Students will be able to identify and classify both national and local producers of medical devices 5. Students will be able to define glossary terms for medical devices with their	MLO	Exam
			1	• 13,14
			2	• 2,3,5,10,11,12,15,16,17 ,19
			3	• 1,2,4,14,20
			4	• 7,18
			5	• 5,10,11,12

		purpose, manufacturers, uses, and safety issues		
BMD0175 Technical Support Fundamentals	CET 1175C	Technical Support Fundamentals: 1. Students will demonstrate competency by performing basic word processing tasks, demonstrating research skills utilizing online resources and presenting data and information in an appropriate manner 2. Students will demonstrate use of computers applications for technical support staff in a health care setting 3. Students will identify and use specific databases needed for the documentation of medical device technology management 4. Students will demonstrate ability to use internet resources related to regulatory requirements 5. Students will research and perform equipment needs	MLO	Question Number(s)
			1	1, 3, 4, 5, 9, 15, 21
			2	1, 2, 3, 4, 5, 8, 10, 11
			3	10, 11, 12, 13, 14,
			4	3, 16, 21
			5	19, 20
			6	3, 4, 5

		6. Students will demonstrate ability to recognize and effectively use customer service fundamentals needed for a hospital environment		
<p>BMD0108</p> <p>Introduction to Biomedical Engineering</p>	<p>BME 1008</p>	<p>Introduction to Biomedical Engineering</p> <p>MLOs:</p> <ol style="list-style-type: none"> 1. Students will demonstrate competency by performing basic word processing tasks, demonstrating research skills utilizing online resources and presenting data and information in an appropriate manner 2. The student will demonstrate knowledge of the history, impact and application of the field of biomedical engineering by recognizing, defining, summarizing and explaining key concepts, historical context and technology related to this field 3. The student will demonstrate knowledge of key subdivisions of the Biomedical Engineering field through recognizing, differentiating, and explaining relevant biomedical technology and processes 	MLO	Exam
			1	<ul style="list-style-type: none"> • 1,2,3,4,5,6,7
			2	<ul style="list-style-type: none"> • 5,6,7,8,9,10,11,12
			3	<ul style="list-style-type: none"> • 9,10,11
			4	<ul style="list-style-type: none"> • 5
			5	7,8

		<p>4. The student will demonstrate detailed knowledge of significant scientific contributors and the impact of their research on biomedical engineering technology</p> <p>5. The student will be able to identify the career opportunities within the field as well as the associated knowledge, skills and abilities (KSAs) required for employment</p>		

PROGRAM DELIVERABLES

Program Expectations

1. The student will have up to two years after the completion of the WI course to complete assessments.
2. The student will be required to take an assessment with an approved SPC Biomedical Engineering Technology credentialed faculty.

Program Objectives

1. Major learning outcomes aligned between WI courses and SPC credit courses (see figure 2).
2. Assessment Measurements are aligned with WI courses and SPC credit courses (see figure 3).

Assessment

1. Competency will be measured by achieving at least a 70% on a proctored assessment, with a maximum of two attempts (retake must be completed within 30 days of the first test). The assessment will be graded by an approved SPC Biomedical Engineering Technology credentialed faculty.

Appeals

All appeals received by a student will adhere to SPC BOT, 6Hx23-4.362.

AGREEMENT SUMMARY

I. Scope and Purpose

A. Programs.

St. Petersburg College (SPC) Workforce Institute (WI) and SPC College of Engineering Technology hereby enter into the following agreement governing the acceptance of up to 14 credits towards the Biomedical Engineering Technology A.S. (BMET-AS).

B. Students.

The agreement is designed primarily to serve TAACCCT grant students entering the BMET-AS degree at SPC.

C. Purpose.

It is the intention of this articulation agreement to facilitate a seamless transition from the WI certificate program to the BMET-AS degree program at SPC.

D. Transfer of Credits.

It is the further intention of this articulation agreement to facilitate a seamless interchange of credits for students who wish to move from WORKFORCE INSTITUTE's Biomedical Technology Certificate program to the BMET-AS degree program at SPC.

E. Date of Effect.

The Agreement will continue in effect from the date at which both parties have affixed their signatures. Review, revision, and termination provisions are discussed below in Part IV, p. 2.

II. Understandings of the parties.

A. For all students covered by this agreement admitted to SPC,

Workforce Institute (WI) will:

1. Publicize the agreement to WI Biomedical Technology certificate students
2. Cooperate with the College of Engineering Technology in a combined marketing plan

3. Provide appropriate registration and academic advisement services
4. Provide accurate records of students completing the certificate
5. Provide documentation that the Course MLOs and, per the Course Outline, are met with a minimum of a 70% overall score for all labs, practice activities, quizzes and/or exams
6. Provide a second retake for any exam not meeting the minimum score within 30 days of the first sitting
7. Applicable articulation forms and Certificate of Completion to SPC

College of Engineering Technology will:

1. Provide students with equivalent credit for courses in biomedical engineering technology, upon completion of WI courses. Student must show proof of completion and pass a proctored SPC assessment.
2. Publicize the agreement among its students and faculty
3. Cooperate with Workforce Institute in a combined marketing plan
4. Provide appropriate registration and academic advisement services
5. An approved SPC Biomedical Engineering Technology credentialed faculty will create the competency assessments.

III. Certificate Program:

This agreement is not limited to the educational courses listed below. Courses may be added outside the review of the annual agreement if warranted by student demand and approval by SPC designated representatives. Any course additions will be detailed by a letter of agreement signed by SPC representatives and will serve as an addendum to this Agreement.

For SPC Workforce Institute certified students admitted to St. Petersburg College in BIOMEDICAL ENGINEERING TECHNOLOGY-A.S. degree or related credit bearing-certificate program at SPC during the period of this agreement:

Workforce Institute Certificate of Completion	Equivalent Biomedical Engineering Technology-A.S. Courses
<p style="text-align: center;">SPC Workforce Institute Biomedical Technology Program</p> <p>Prior learning assessment through written examination with a pass rate of 70% or greater on all exams with a second retake available within 30 days of the first sitting, if the student scores less than the minimum.</p>	<p>BME1008 Introduction to Biomedical Engineering (2 credits)</p> <p>EET1214C Instrumentation and Control Systems (1 credit)</p> <p>EET1084C Introduction to Basic Electronics (3 credits)</p> <p>EET 1412C Technology and Techniques (3 credits)</p> <p>ETS 1407 Survey of Medical Technology (3 credits)</p> <p>CET 1175C Technical Support Fundamentals (2 credits)</p>

IV. Review, Amendment, and Termination

All parties are committed to the concept of a long-standing agreement. This agreement will be amended when programs are added, deleted, or significantly modified. Amendments may take the form of letters signed by the signatories of the agreement or their designated representative.

The agreement will be reviewed every three years, or at any time at the request of either party. Either party may terminate the agreement; however termination will not be executed without a negotiated teach-out agreement on programs with students currently enrolled.

V. Signatories

Dr. Natavia Middleton
Interim Dean, Natural Sciences
Date: _____

Dr. James Connolly
Director, Workforce Institute
Date: _____