



Program Revision Proposal: Creating New Program(s) from Existing Program(s) Form 3B Version 2017-03-27

This form should be used to seek SUNY's approval to create one or more new programs from existing, registered programs. *A campus is not required to submit a Program Announcement (PA) or a Letter of Intent (LI) for these types of new programs.* The Chief Executive or Chief Academic Officer should submit **a signed cover letter and this completed form** to the SUNY Provost at program.review@suny.edu.

Section 1. General Information	
a) Institutional Information	Institution's 6-digit SED Code : 211000
	Institution's Name: Binghamton University
	Address: 4400 Vestal Parkway East, Binghamton, NY 13902
b) Program Locations	List each campus where the entire program will be offered (with each institutional or branch campus 6-digit SED Code): 211000
	List the name and address of off-campus locations (i.e., extension sites or extension centers) where courses will offered, or check here [X] if not applicable :
c) Proposed Program Information	Program Title: Physics/Applied Physics Track, B.S. and Mechanical Engineering, M.S. 4+1
	Award (s) (e.g., A.A., B.S./M.S.): B.S. / M.S.
	Number of Required Credits: Minimum [147] If tracks or options, largest minimum []
	Proposed HEGIS Code : BS 1902.00 / MS 0910.00
	Proposed 6-digit CIP 2020 Code : BS 40.0801 / MS 14.1901
	If the program will be accredited, list the accrediting agency and expected date of accreditation:
	If applicable, list the SED professional licensure title(s) ¹ to which the program leads: Licensure-qualifying Professional Engineer
d) Campus Contact	Name and title: Terrence Deak, Vice Provost and Dean of The Graduate School
	Telephone: 607-777-2077 E-mail: tdeak@binghamton.edu
e) Chief Executive or Chief Academic Officer Approval	Signature affirms that the proposal has met all applicable campus administrative and shared governance procedures for consultation, and the institution's commitment to support the proposed program. E-signatures are acceptable.
	Name and title: Donald E. Hall, Provost and Executive Vice President for Academic Affairs
	Signature and date:
	If the program will be registered jointly² with one or more other institutions, provide the following information for <u>each</u> institution:
	Partner institution's name and 6-digit SED Code : Name, title, and signature of partner institution's CEO (or append a signed letter indicating approval of this proposal):

¹ If the proposed program leads to a professional license, a [specialized form for the specific profession](#) may need to accompany this proposal.
² If the partner institution is non-degree-granting, see SED's [CEO Memo 94-04](#).

Section 2. Multi-Award and Multi-Institution Programs

☐ Not a multi-award or multi-institution program. *Proceed to Section 3.*

Check one.

- ☒ This proposal is for a **multi-award program** that leads to two separate awards (e.g., A.S./B.A., B.S./M.S.). **Complete Section 2.1, below.** *NOTE: Such programs generally involve special admissions for students who have the capacity to complete all awards, curricular integration between the component programs, and shortened time to degree compared to taking the programs separately.*
- ☐ This proposal is for a **multi-institution program** (also called a “jointly registered program”) to be offered jointly by two or more institutions. **Complete Section 2.2 below.** *NOTE: Such programs involve a formal agreement between two or more institutions to offer courses leading to an award.*
- ☐ This proposal is for a **multi-institution, multi-award program** to be offered jointly by more two or more institutions and lead to two separate awards. **Provide a single, consolidated response that reflects all the items in Sections 2.1 and 2.2, below.**

Section 2.1. Multi-Award Programs

- a) Check all SED-defined [formats, mode and other program features](#) that apply to the **entire program**.

Format(s): ☒ Day ☐ Evening ☐ Weekend ☐ Evening/Weekend ☐ Not Full-Time

Modes: ☒ Standard ☐ Independent Study ☐ External ☐ Accelerated ☒ Distance Education

*NOTE: If the program is designed to enable students to complete 50% or more of the course requirements through distance education, check Distance Education, see Section 10, and **append a Distance Education Format Proposal.***

Other: ☐ Bilingual ☐ Language Other Than English ☐ Upper Division ☐ Cooperative ☐ 4.5 year ☐ 5 year

Note: Distance education format only applies to the M.S. portion of the B.S. / M.S. 4+1 program. The inclusion of a distance education modality for the Mechanical Engineering, MS was previously approved and [appeared in the IRP](#) as of 4/2022.

- b) List registered programs at the institution identified in Section 1 whose courses will contribute to this program. Add rows as needed.

Programs	Program Title	Award	SED Program Code
<i>Program 1</i>	Physics (Applied Physics track)	B.S.	03125
<i>Program 2</i>	Mechanical Engineering	M.S.	82487

- c) List all the courses required for each existing program, and indicate which ones will be counted toward both awards.

To prepare students for the graduate courses, a carefully prescribed set of *double-counted* courses is defined that will satisfy both B.S. and M.S. degree requirements. The requirements for each program are shown below. Double-counted courses are noted where applicable.

The tables below summarize the course requirements of each program and the courses that will double count toward both degrees.

Physics/Applied Physics Track, B.S.

Core Courses	Course Titles	Combined program	Credit Hours
PHYS 121 (or 131)	General Physics I		4
PHYS 122 (or 132)	General Physics II		4
PHYS 210	Programing in Physics		4
PHYS 227	Sophomore Laboratory		4
PHYS 271	Math Methods in Physics		4
PHYS 323	Modern Physics		4
PHYS 327	Junior Laboratory		4
PHYS 331	Electromagnetic Theory I		4
PHYS 332	Electromagnetic Theory II		4
PHYS 341	Analytical Mechanics		4
PHYS 421	Quantum Mechanics I		4
MATH 224	Differential Calculus		2
MATH 225	Integral Calculus		2
MATH 226	Integration Tech & Application		2
MATH 227	Infinite Series		2
MATH 323	Calculus III		4
MATH 324 (or MATH 371)	ODE's for Scientists/Engineers (or Ordinary Diff. Equations)		4
CHEM 111	Chemical Principles		4
One Mechanical Engineering Undergraduate Technical Elective course	Choose 1: ME 211: Intro to Solid Mechanics ME 351: Fluid Mechanics ME 421: Mechanical Vibrations		3
Two Technical Electives	Two ME 5XX (graduate-level) Mechanical Engineering courses will be chosen from the MS ME Core Courses or Area of Emphasis courses	Double counted towards the MS ME degree	6
One Technical Elective	One ME 5XX (graduate-level) Area of Emphasis course	Double counted toward the MS ME degree	3
Total Credit Hours			76

Mechanical Engineering, M.S., Project Option

Courses	Course Titles	Combined program	Credit Hours
Two Core Courses	Core Courses – Choose 1 Computational Course and 1 Mechanics Course: Computational Courses: <ul style="list-style-type: none"> ME 517 - Finite Element Analysis I ME 541 - Computational Fluid Dynamics Mechanics Courses: <ul style="list-style-type: none"> ME 511 - Elasticity ME 514 - Plasticity ME 518 - Applied Mechanics for Design ME 520 - Mechanics and MFG of Composite ME 524 - Adv. Mech. Vibrations ME 550 - Intro to Fluid Dynamics 	The three ME 5XX (graduate-level) Mechanical Engineering courses taken in the 4 th year of the BS Physics-Applied Physics track program will double count in both the undergraduate and the graduate programs.	6
Four Area of Emphasis courses	Four ME 5XX (graduate-level) Mechanical Engineering courses are taken from one Area of Emphasis		12
Three Technical Electives	Three ME 5XX (graduate-level) Mechanical Engineering courses or Two ME 5XX (graduate-level) Mechanical Engineering courses and one 5XX (graduate-level) course outside the Mechanical Engineering Dept. <i>Note: One of the Technical Electives replaces ME 535 – Analytical Methods I, which is required for all other students in the MS ME program. The Technical Elective replacing ME 535 is marked as “new” in the Program Schedule.</i>		9
ME 598 or ME 594	ME Projects or Industrial Internship		3
Total Credit Hours			30

The students in the combined program can choose one of the three Areas of Emphasis in the Mechanical Engineering Department as follows:

- **Solid Mechanics and Mechanical Design** - mechanics of materials and structures, computational mechanics, biomechanics, waves and vibration, computer-aided design, design optimization, design with reliability, design for additive manufacturing
- **Thermofluid and Energy Sciences** - heat and mass transfer in biological/environmental/industrial applications, microfluidics/nanofluidics, complex fluids, interfacial phenomena/wetting, additive manufacturing, energy generation, energy storage, energy efficient space heating and cooling, smart electronics and data center cooling, small-scale power harvesting
- **Dynamics and Mechatronics** - electromechanical system dynamics, mechanical vibrations, rigid-body dynamics, MEMS/NEMS, acoustic measurement techniques, mechatronics, robotics, microscale vibrations and acoustics, nonlinear dynamics, sensors and actuators, control systems

Specific graduate-level Mechanical Engineering courses are counted in each Area of Emphasis. A listing of the specific courses in each Area of Emphasis is available to students on the Mechanical Engineering Graduate website and from the Graduate Studies Director.

- d) What is the length of time students will have to complete the proposed program?
The Physics/Applied Physics Track, B.S. degree can be completed in 4 years by a full-time student. A full-time student in the combined program can complete the Mechanical Engineering, M.S. requirements in 1 additional year. Thus, the Physics/Applied Physics Track, B.S. / Mechanical Engineering, M.S. 4+1 program is expected to be completed by full-time students in 5 years.
- e) What are the admissions requirements for the new program, and how are they related to student success?
Students who have a GPA of 3.3 or higher are eligible to apply to the program. Applying to the program normally occurs after the third semester. Applications that do not meet this GPA requirement will be evaluated by the Physics Department Admissions Committee.
- f) Complete a **SUNY Program Schedule** to show how students will be able to schedule all required courses to complete the multi-award program.

Section 2.2. Multi-Institution Programs

☐ All partner institutions are listed in Section 1, with CEO information and a signature for each partner.

- a) Check all SED-defined [formats, mode and other program features](#) that apply to the **entire program**.

Format(s): ☐ Day ☐ Evening ☐ Weekend ☐ Evening/Weekend ☐ Not Full-Time

Modes: ☐ Standard ☐ Independent Study ☐ External ☐ Accelerated ☐ Distance Education

NOTE: *If the program is designed to enable students to complete 50% or more of the course requirements through distance education, check Distance Education, see Section 10, and **append a Distance Education Format Proposal**.*

Other: ☐ Bilingual ☐ Language Other Than English ☐ Upper Division ☐ Cooperative ☐ 4.5 year ☐ 5 year

- b) List all the courses required for the program, and indicate which ones will be completed at each institution.
- c) Describe the administrative provisions for coordinating admissions, advisement and financial aid for the program between the two institutions.
- d) Describe the program's policies governing residency requirements and tuition charges.
- e) Explain any other special arrangements or requirements arising from the multi-institution nature of the program.
- f) Complete a **SUNY Program Schedule** to show how students will be able to schedule all required courses to finish the program.

Section 3. New Program from Option/ Concentration/Track in an Existing Program

This section should be used to propose the creation of a new program from an option/concentration/track³ in existing, registered programs, which is sometimes called "disaggregation."

The new program must be based entirely on existing courses from an option/concentration/track in a registered program.

A new program proposal (SUNY Form 2A or 2B) must be submitted – instead of this form – when:

- the new program will be offered at a different location than the campuses identified in Section 1, or

³ SUNY System uses these terms interchangeably.

- a Master Plan Amendment is required for the new program, or
- one or more new courses will be added to the program at the same time, or
- there are changes to the program admissions, or
- there will be changes to the evaluation elements

Note: The institution can use this form (3B) to register a new program from an existing option/concentration/track, and make changes to it after it is registered by submitting Form 3A. As always, institutions can only advertise and offer a program *as it is currently registered*.

Section 3.1. Revision of Existing Program

Registered Program to be Changed	
Program Title:	
SED Program Code	
Award(s) (e.g., A.A., B.S.):	
Number of Required Credits:	Minimum [] If tracks or options, largest minimum []
HEGIS Code :	
CIP 2010 Code :	
Effective Date of Change:	
Effective Date of Completion ⁴	

- a) List all registered options/concentrations/tracks and indicate which, if any, will be removed.

Section 3.2. Proposed New Program

- a) Describe the new program and the rationale for converting the existing coursework to a separately registered program.
- b) Affirm that the admissions standards and evaluation methods are unchanged from the currently registered program.
- c) Explain the expected impact of the new program on existing programs (enrollment, facilities, budget, faculty assignments, etc.)
- d) Describe adjustments the institution will make to its current resource allocations to support the new program.
- e) Complete a *SUNY Program Schedule*. If the new program has separate options/concentrations/tracks, complete a *Program Schedule* for each one.
- f) Complete a *SUNY Faculty Table* for all full-time, part-time, and faculty to be hired.

⁴ If the current program(s) must remain in its current form until enrolled students have graduated, the anticipated effective date by which continuing students will have completed the current version of the program(s).

SUNY Undergraduate Program Schedule

SUNY Graduate Program Schedule

Please see the [program schedules](#) below.

SUNY Undergraduate and Graduate Sample Program Schedules

Campus Name

Program/Track Title and Award

Calendar Type

SUNY Transfer Path Name (if one exists)

Binghamton University

Physics/Applied Physics Track BS - Mechanical Engineering MS 4+1 Program

Semester

Quarter

Trimester

Other

X

Physics

<----- Use Dropdown Arrow.

Use the table to show how a typical student may progress through the program. Check all columns that apply to a course or enter credits where applicable.

KEY Course Type: Required (R), Restricted Elective (RE), Free Elective (FE). Course Credits: Number of Credits for individual course (Enter number.) GER Area: SUNY General Education Requirement Area (Enter Area Abbreviation from the drop-down menu.) GER Credits: (Enter number of course credits.) LAS: Liberal Arts & Sciences Credits (Enter X if course is an LAS course.) Major: Major requirement (Enter X.) TPath: SUNY Transfer Path Major & Cognate Courses (Enter X.) Elective/Other: Electives or courses other than specified categories (Enter X.) Upper Div: Courses intended primarily for juniors and seniors outside of the major (Enter X.) Upper Div Major: Courses intended primarily for juniors and seniors within the major (Enter X.) New: new course (Enter X.) Co/Prerequisite(s): List co/prerequisite(s) for the noted courses. SUNY GER Area Abbreviations (the first five listed in order of their frequency of being required by SUNY campuses): Basic Communication (BC), Math (M), Natural Sciences (NS), Social Science (SS), Humanities (H), American History (AH), The Arts (AR), Other World Civilizations (OW), Western Civilization (WC), Foreign Language (FL).

The table will automatically update the number of credits, courses and categories in the program totals table at the bottom of the chart.

Label each term in sequence, consistent with the institution’s academic calendar (e.g., Fall 1, Spring 1, Fall 2.

Term 1: Fall 1											
Course Number & Title (& Type)	Number of Credits	GER Area	GE Credits	LAS	Major	Elective/Other	Upper Div	Upper Div Major	TPath	New Course	Co/Prerequisite
PHYS 121 Gen. Phys. I or PHYS 131 Gen. Phys. I (Calc. Based)	4	NS	4	X	X				X		
MATH 224 Differential Calculus	2	M		X	X				X		
MATH 225 Integral Calculus	2			X	X				X		MATH 224
GER/LAS (RE)	4	AR	4	X							
GER/LAS (RE)	4	AH	4	X							
Term Totals	16	4	12	16	8				3		(X)
Term 2: Spring 1											
Course Number & Title (& Type)	Number of Credits	GER Area	GE Credits	LAS	Major	Elective/Other	Upper Div	Upper Div Major	TPath	New Course	Co/Prerequisite
PHYS 122 Gen. Phys. II or PHYS 132 Gen. Phys. II (Calc. Based)	4			X	X				X		PHYS 121 or 131
MATH 226 Int. Tech & App.	2			X	X				X		MATH 225
MATH 227 Infinite Series	2			X	X				X		MATH 226
GER/LAS (RE)	4	H	4	X							
GER/LAS (RE)	4	FL	4	X							
Term Totals	16	2	8	16	8				3		(X)
Term 3: Fall 2											
Course Number & Title (& Type)	Number of Credits	GER Area	GE Credits	LAS	Major	Elective/Other	Upper Div	Upper Div Major	TPath	New Course	Co/Prerequisite
PHYS 210 Programming in Physics	4			X	X				X		
PHYS 323 Modern Physics	4			X	X		X	X	X		PHYS 121/122 or 131/132
MATH 324 ODE's For Sci/Engineers or MATH 371 Ordinary Diff. Eq.	4			X	X		X	X			MATH 227 or MATH 230
GER/LAS (RE)	4	BC	4	X							
Term Totals	16	1	4	16	12		8	8	2		(X)
Term 4: Spring 2											
Course Number & Title (& Type)	Number of Credits	GER Area	GE Credits	LAS	Major	Elective/Other	Upper Div	Upper Div Major	TPath	New Course	Co/Prerequisite
PHYS 271 Math Methods in Physics	4			X	X				X		MATH 227 and 323
PHYS 227 Sophomore Laboratory	4			X	X						PHYS 121/122 or 131/132
MATH 323 Calculus III	4			X	X		X	X	X		MATH 227 or MATH 230
GER/LAS (RE)	4	SS	4	X							
Term Totals	16	1	4	16	12		4	4	2		(X)
Term 5: Fall 3											
Course Number & Title (& Type)	Number of Credits	GER Area	GE Credits	LAS	Major	Elective/Other	Upper Div	Upper Div Major	TPath	New Course	Co/Prerequisite
GER/LAS (RE)	4	OW	4	X							
CHEM 111 Chemical Principals	4			X	X						
PHYS 331 Electromagnetic Theory I	4			X	X		X	X			MATH 323
Upper Level Elective (RE)	4					X	X				
Term Totals	16	1	4	12	8	4	8	4			(X)
SUNY System Administration Office Academic Programs, Planning and Assessment SUNY Undergraduate Sample Program Schedule page 1 of 2											

Term 6: Spring 3											
Course Number & Title (& Type)	Number of Credits	GER Area	GE Credits	LAS	Major	Elective/Other	Upper Div	Upper Div Major	TPath	New Course	Co/Prerequisite
PHYS 327 Junior Laboratory	4			X	X		X	X			PHYS 323, 331, and 341
PHYS 332 Electromagnetic Theory II	4			X	X		X	X			PHYS 331
PHYS 341 Analytical Mechanics	4			X	X		X	X			PHYS 121/122 or 131/132 & 323,
											and MATH 324 or 371
Undergraduate ME Course from ME 211, 351, 421	3				X						
Term Totals	15			12	15		12	12			(X)

Term 7: Fall 4											
Course Number & Title (& Type)	Number of Credits	GER Area	GE Credits	LAS	Major	Elective/Other	Upper Div	Upper Div Major	TPath	New Course	Co/Prerequisite
PHYS 421 Quantum Mechanics I	4			X	X		X	X			PHYS 323, 331, and 341
Technical Elective (ME Core Course or AOE Course)	3				X	X					
Upper Level LAS Course (RE)	4			X		X	X				
Upper Level Elective (RE)	4					X	X				
Term Totals	15			8	7	10	12	4			(X)

Term 8: Spring 4											
Course Number & Title (& Type)	Number of Credits	GER Area	GE Credits	LAS	Major	Elective/Other	Upper Div	Upper Div Major	TPath	New Course	Co/Prerequisite
Technical Elective (ME Core Course or AOE Course)	3				X	X					
Technical Elective (ME Area of Emphasis (AOE) Course)	3				X	X					
Upper Level Elective (RE)	4					X	X				
Upper Level Elective (RE)	4					X	X				
Upper Level Elective (RE)	2					X	X				
Term Totals	16				6	16	10				(X)

Program Total Summary

Total Credits	SUNY GER Areas	SUNY GER Credits	Liberal Arts & Sciences Credits	Major Credits	Elective and Other Credits	Upper Division Credits	Upper Division Major Credits	Total TPath Courses	New Courses
126	10	32	96	76	30	54	32	10	

GER Area Summary

Basic Communication (BC)	1	The Arts (AR)	1	Critical Thinking (T)	1
Mathematics (M)	1	American History/Diversity (AH)	1	Information Literacy (I)	1
Natural Sciences (NS)	1	Western Civilization (WC)	1		
Social Sciences (SS)	1	Other World Civilizations (OW)	1		
Humanities (H)	1	Foreign Language (FL)	1		

Term 9: Fall 5											
Course Number & Title (& Type)	Number of Credits	GER Area	GE Credits	LAS	Major	Elective/Other	Upper Div	Upper Div Major	TPath	New Course	Co/Prerequisite
Core Course or Area of Emphasis Course	3										
Core Course or Area of Emphasis Course	3										
Technical Elective	3										
Term Totals	9										(X)

Term 10: Spring 5											
Course Number & Title (& Type)	Number of Credits	GER Area	GE Credits	LAS	Major	Elective/Other	Upper Div	Upper Div Major	TPath	New Course	Co/Prerequisite
Area of Emphasis Course	3										
Technical Elective	3										
Technical Elective*	3									X	
ME 598 - ME Projects or ME 594 - Industrial Internship	3										
Term Totals	12										(X)

* This is the Technical Elective that replaces ME 535 – Analytical Methods I, which is required for all other students in the MS ME program.

Program Total:	21	+ 9 double-counted credit hours taken in the 4th year of the B.S. Physics (Applied Physics Track) program = 30 cr. total
----------------	----	--

Identify the required comprehensive, culminating element(s), such as a thesis or examination, including course number(s), if applicable:

Termination project submitted at the end of ME 598 or ME 594

Section 4. SUNY Faculty Table

- a) If applicable, provide information on faculty members who will be teaching new or significantly revised courses in the program. Expand the table as needed.

Not applicable

- b) **Append** at the end of this document position descriptions or announcements for each to-be-hired faculty member

Not applicable

(a)	(b)	(c)	(d)	(e)	(f)
Faculty Member Name and Title and/or Rank at the Institution (Include and identify Program Director.)	% of Time Dedicated to This Program	Program Courses Which May Be Taught (Number and Title)	Highest and Other Applicable Earned Degrees (include College or University)	Discipline(s) of Highest and Other Applicable Earned Degrees	Additional Qualifications: List related certifications and licenses and professional experience in field.
PART 1. Full-Time Faculty					
Part 2. Part-Time Faculty					
Part 3. To-Be-Hired Faculty (List as TBH1, TBH2, etc., and provide expected hiring date instead of name.)					