

Accelerated Undergraduate/Graduate (BS/MS) Dual Degree Program in Computer Engineering Technology (BS) and Computer Science (MS)

The BS degree in Computer Engineering Technology requires 128 semester hours and the MS degree in Computer Science requires 30 semester hours. Undergraduate Computer Engineering Technology majors who enter the accelerated BS in Computer Engineering Technology/MS in Computer Science dual degree program are **permitted to double count up to 6 semester hours of overlapping courses**. Students working toward a BS degree in Computer Engineering Technology will be advised to select specific Mathematics or Computer Science courses to fulfill General Education, Technical, or Free Electives so they are well prepared in Mathematics and programming and so that they have the necessary theoretical foundation in computing by the time they reach the MS degree in Computer Science. The 6 semester hours of overlapping courses come from taking graduate level Computer Science courses which fulfill graduate program requirements and which are also used to satisfy credit hour requirements for the BS degree. Specifically, we recommend two graduate-level Computer Science courses (of up to 6 semester hours) be chosen to fulfill Technical and Free Electives required for the BS degree in Computer Engineering Technology. Due to the design of this program combination, students also have room in their schedule during spring semester in year 5 to select up to two graduate-level Computer Science electives that apply only to the MS degree. Other than the 6 semester hours of courses that students may double count toward their BS degree in Computer Engineering Technology and the MS degree in Computer Science, students complete all other BS degree requirements.

Undergraduate students with the proper prerequisites are permitted and encouraged to take graduate-level Computer Science courses. Students enrolled in the accelerated BS in Computer Engineering Technology/MS in Computer Science dual degree program must complete ***all*** of their degree requirements for the BS degree in Computer Engineering Technology before being permitted to register for either thesis or project in the MS degree in Computer Science.

Undergraduate students who apply to RIT in Computer Engineering Technology are accepted initially into the BS degree program. Students interested in the accelerated BS in Computer Engineering Technology/MS in Computer Science dual degree program request entry into this program using a Change of Program form. **We encourage students to wait until at least the end of their second year at RIT before making this request.** Students should consult their academic advisor prior to officially filing the form. The Associate Graduate Program Coordinator in Computer Science currently handles all matters related to the accelerated BS in Computer Engineering Technology /MS in Computer Science dual degree program, and with consultation ***if needed*** with appropriate individuals in Computer Engineering Technology, determines whether or not a student is admitted to this dual degree program.

We will not define all possible combinations of Computer Science courses and program paths that might be used for a BS in Computer Engineering Technology/MS in Computer Science combination, although we illustrate one possible scenario below. Rather, we will advise students and guide them in putting together appropriate collections of courses that help them meet their

goals once they are admitted to the accelerated BS in Computer Engineering Technology/MS in Computer Science dual degree program.

The following pages have been taken directly from the document filed with New York State that proposed the accelerated BS in Computer Engineering Technology/MS in Computer Science dual degree program under semesters. These pages have been *updated* to reflect several modest curriculum changes that have taken place since that time. Table 1a and the notes that follow it depict the BS degree for a student planning to complete the accelerated BS in Computer Engineering Technology/MS in Computer Science dual degree program. Table 1b (case 1) and the notes that follow it depict the MS degree with a thesis option for a student planning to complete the accelerated BS in Computer Engineering Technology/MS in Computer Science dual degree program. Again, it should be stressed that these tables only demonstrate the feasibility of completing the accelerated BS in Computer Engineering Technology/MS in Computer Science dual degree program in one additional year beyond the BS degree.

Table 1a: Undergraduate Program Schedule (BS degree in Computer Engineering Technology)

Term: Fall 1		Check course classification (s)				
Course Number & Title	CR	LAS	Maj	New	Prerequisite(s)	
MATH-171 Calculus A (LAS-P7A)	3	3				
EEET-111 DC Circuits	3		3		MATH-111 or higher, Co-req: EEET-112	
EEET-112 DC Circuits Lab	1		1		MATH-111 or higher, Co-req: EEET-111	
CPET-141 Digital Fundamentals	2		2		Co-req: CPET-142	
CPET-142 Digital Fundamentals Lab	1		1		Co-req: CPET-141	
GE-Perspective (LAS-P1)	3	3				
First Year Seminar (LAS-F1)	3	3				
ACSC-010 Year One	0					
Term credit total:	16	9	7			
Term: Fall 2		Check course classification (s)				
Course Number & Title	CR	LAS	Maj	New	Prerequisite(s)	
MATH-211 Elements of Multivariable Calculus and Differential Equations	3	3			MATH-172	
EEET-211 Electronics I	3		3		EEET-121 & 122; Co-req: EEET-212	
EEET-212 Electronics I Lab	1		1		EEET-121 & 122; Co-req: EEET-211	
CPET-201 Microcontroller Systems	2		2		CPET-141, 142, 121; Co-req: CPET-202	
CPET-202 Microcontroller Systems Lab	1		1		CPET-141, 142, 121, Co-req: CPET-201	
GE-Perspective (LAS-P3)	3	3				
CHMG-141/145 General & Analytical Chem I Lecture/Lab (LAS-P5)	4	4				
Wellness Activity 2	0					
Term credit total:	17	10	7			
Term: Fall 3		Check course classification (s)				
Course Number & Title	CR	LAS	Maj	New	Prerequisite(s)	
MATH-190 Discrete Mathematics for Computing (General Education Elective)	3	3			None (co-requisites MATH 182 or MATH 182A or MATH 172 or equivalent courses)	
EEET-321 Signals Systems and Transforms	4		4		EEET-121, 122, MATH-211, Co-req: MATH-251	
CPET-341 Hardware Description Lang	2		2		CPET-241 & 242, Co-req: CPET-342	
CPET-342 Hardware	1		1		CPET-241 & 242, Co-req: CPET-341	

Term: Spring 1		(Check course classification (s))				
Course Number & Title	CR	LAS	Maj	New	Prerequisite(s)	
MATH-172 Calculus B (LAS-P7B)	3	3			MATH-171	
EEET-121 AC Circuits	3		3		EEET-111 & 112, MATH-171, Co-req: EEET-122	
EEET-122 AC Circuits Lab	1		1		EEET-111 & 112, MATH-171, Co-req: EEET-121	
CPET-121 Computational Problem Solving I (LAS)	3	3				
GE-Perspective (LAS-P2)	3	3				
Writing Seminar (LAS-F2)	3	3				
Wellness Activity 1	0					
Term credit total:	16	12	4			
Term: Spring 2		(Check course classification (s))				
Course Number & Title	CR	LAS	Maj	New	Prerequisite(s)	
General Education (Math/Science) Elective	4	4			Depends on the specific course chosen	
EEET-221 Electronics II	2		2		EEET-211 & 212, Co-req: EEET-222	
EEET-222 Electronics II Lab	1		1		EEET-211 & 212, Co-req: EEET-221	
CPET-241 Digital Systems Design	3		3		CPET-141 & 142, Co-req: CPET-242	
CPET-242 Digital Systems Design Lab	1		1		CPET-141 & 142, Co-req: CPET-241	
MATH-251 Probability and Statistics I	3	3			MATH 182 or MATH 172 or MATH 182A or 1016 282 or equivalent courses	
GE-Perspective (LAS-P4)	3	3				
Term credit total:	17	10	7			
Term: Spring 3		(Check course classification (s))				
Course Number & Title	CR	LAS	Maj	New	Prerequisite(s)	
CPET-499 Comp Eng Tech Co-Op	0				EEET-299, CPET 201, 202, & 321	
Term credit total:	0	0	0			

Description Lang Lab					
CPET-321 Computational Problem Solving II (LAS)	3	3			CPET-121
GE-Immersion (LAS-I1)	3	3			
EEET-299 Career Orientation	1		1		
Term credit total:	17	9	8		
Term: Fall 4		Check course classification (s)			
Course Number & Title	CR	LAS	Maj	New	Prerequisite(s)
CSCI-262 Introduction to Computer Science Theory (Technical Elective 1 of 2)	3		3		MATH 190 and CSCI 141 or equivalent
PHYS-111 College Physics I (LAS-P6)	4	4			
EEET-421 Design Innovation (Writing Intensive)	3		3		EEET-221 & CPET-201
GE-Immersion (LAS-I2)	3	3			
Term credit total:	13	7	6		

Term: Summer 3		Check course classification (s)			
Course Number & Title	CR	LAS	Maj	New	Prerequisite(s)
CPET-499 Comp Eng Tech Co-Op	0				EEET-299, CPET 201, 202, & 321
Term credit total:	0	0	0		
Term: Spring 4		Check course classification (s)			
Course Number & Title	CR	LAS	Maj	New	Prerequisite(s)
MFET-436 Engineering Economics	3		3		MATH-111 or higher
CPET-561 Embedded Systems Design I	4		4		CPET-201, 202, 341, 342
CPET-461 Real Time Operating Systems	3		3		CPET-201, 202, 321
CSCI-605 Advanced Object-Oriented Programming Concepts (Free Elective 1 of 2)	3				
Term credit total:	13(*)	0	10		(*)Student uses 3 credits of free electives to take CSCI-605, a graduate level Computer Science bridge course that applies only to the BS degree.

Term: Summer 4		Check course classification (s)			
Course Number & Title	CR	LAS	Maj	New	Prerequisite(s)
CPET-499 Comp Eng Tech Co-Op	0				CPET 201, 202, & 321
Term credit total:	0	0	0		
Term: Fall 5		Check course classification (s)			
Course Number & Title	CR	LAS	Maj	New	Prerequisite(s)
Free Elective 2 of 2 (BS/MS Overlapping Course)	3				Depends on the specific course chosen
CPET-481 Networking Technologies	3		3		MATH-251 and MATH-171
EEET-425 Digital Signal Processing	4		4		EEET-321
Technical Elective 2 of 2 (BS/MS Overlapping Course)	3		3		Depends on the specific course chosen
Term credit total:	13(*)	0	10		(*) Student uses 3 credits of free electives and 3 credits of technical electives to take overlapping BS/MS courses that count toward both degrees.

Term:		Check course classification (s)			
Course Number & Title	CR	LAS	Maj	New	Prerequisite(s)
Term credit total:					
Term: Spring 5		Check course classification (s)			
Course Number & Title	CR	LAS	Maj	New	Prerequisite(s)
CPET-563 Embedded Systems Design II	3		3		CPET-561
Graduate Elective 1 of 2	3				Depends on the specific course chosen
Graduate Elective 2 of 2	3				Depends on the specific course chosen
GE-Immersion (LAS-I3)	3	3			
Term credit total:	6(*)	3	3		(*) Student uses 6 credits to take two graduate level Computer Science courses that only apply to the MS degree.

Program Totals:	Credits: 128	Liberal Arts & Sciences: 60	Major: 62	Elective & Other: 6
------------------------	---------------------	----------------------------------------	------------------	--------------------------------

Cr: credits **LAS:** liberal arts & sciences **Maj:** major requirement **New:** new course
Prerequisite(s): list prerequisite(s) for the noted courses

NOTES:

- (1) By selecting graduate level Computer Science courses as their graduate electives in the spring of year 5, students increase the likelihood of completing their MS degree with one additional year. If they select undergraduate courses instead, they will need to add additional graduate level Computer Science courses to their plan of study in year 6. Students also may consider adding more coursework to fall and spring semesters in years 4 and 5 in order to reduce the amount of time needed to earn both degrees.
- (2) There are numerous collections of course choices that students can make in order to successfully combine degree requirements for the BS in Computer Engineering Technology with an MS in Computer Science and we do not identify all of those choices here. Rather, we list below one possible set of course choices that would satisfy both programs.
- (3) The MS in Computer Science can be completed by following one of two possible sets of requirements. Graduate Computer Science courses are three semester credits each. The MS project is three semester credits and the MS thesis is 6 semester credits.
 - Complete one core course – CSCI-665 (Foundations of Algorithms)
 - Complete three courses taken from one cluster
 - Complete four electives
 - Complete a thesis

or

- Complete one core course – CSCI-665 (Foundations of Algorithms)
- Complete three courses taken from one cluster
- Complete five electives
- Complete a project (this also requires student to participate in and complete a required colloquium component)

One possible set of course choices for a student completing a BS in Computer Engineering Technology and planning to complete the MS in Computer Science by doing a thesis would be:

- Take CSCI-605 (Advanced Object-Oriented Programming Concepts) as a Free Elective in the spring of year 4 (this is considered a graduate Computer Science bridge course and it does not count toward an MS in Computer Science degree), but it does count toward the BS in Computer Engineering Technology
- Take CSCI-620 (Introduction to Big Data) as a Free Elective in the fall of year 5
- Take CSCI-665 (Foundations of Algorithms) as a Technical Elective in the fall of year 5
- Take CSCI-720 (Big Data Analytics) as a Graduate Elective in the spring of year 5
- Take CSCI-622 (Data Security and Privacy) as a Graduate Elective in the spring of year 5

Table 1b: Graduate Program Schedule (MS degree in Computer Science) (case 1)

NOTE: The following is an example for a student who completes the BS in Computer Engineering Technology/MS in Computer Science program by choosing the research path and the Data Management cluster.

Term: Fall 6				Term: Spring 6			
Course Number & Title	Credits	New	Prerequisite(s)	Course Number & Title	Credits	New	Prerequisite(s)
Graduate Computer Science Elective	3		Depends on the specific course chosen	Graduate Computer Science Elective	3		Depends on the specific course chosen
Graduate Computer Science Elective	3		Depends on the specific course chosen	CSCI 790 Computer Science MS Thesis	6		Permission of thesis committee and graduate program coordinator
Graduate Computer Science Elective	3		Depends on the specific course chosen				
Term credit total:	9			Term credit total:	9		
Term:				Term:			
Program Totals:		Credits: 30 (= 6 overlapping credits from graduate courses applied to BS degree + 6 credits from two graduate courses taken in year 5 in lieu of graduate electives + 18 credits needed to complete the MS degree)		For Master's programs, identify the required comprehensive, culminating element(s) (e.g., thesis), including course number if applicable: Computer Science MS Thesis (CSCI 790)			

NOTES:

- (1) For this example, the student uses CSCI 620, 622, and 720 to satisfy the MS degree requirement that three courses are chosen from one cluster (in this case, the Data Management cluster).
- (2) CSCI 620 (Introduction to Big Data) and CSCI 665 (Foundations of Algorithms) are the two courses that are overlapping between the BS and MS degree programs.
- (3) CSCI 720 (Big Data Analytics) and CSCI 622 (Data Security and Privacy) are recommended courses to take in place of Graduate Electives in the spring of year 5. These two courses only apply to the MS degree and are not overlapping.
- (4) One possible specific set of course choices for graduate Computer Science electives in year 6 is given below.

Term: Fall 6 (illustrative example)				Term: Spring 6 (illustrative example)			
Course Number & Title	Credits	New	Prerequisite(s)	Course Number & Title	Credits	New	Prerequisite(s)
CSCI 662 Foundations of Cryptography	3		Completion of (CSCI-603 or CSCI-602) and (CSCI-605 or CSCI-604) and (CSCI-661 or CSCI-660) with grades of B or better. Prerequisite may also be satisfied by successful completion of (CSCI-243 or 4003-334) and (CSCI-262 or CSCI-263).	CSCI 721 Data Cleaning and Preparation	3		CSCI-620 or (CSCI-420 and CSCI-320) or (4003-485 and 4003-487) or equivalent course.
CSCI 631 Foundations of Computer Vision	3		Completion of (CSCI-603 or CSCI-602) and (CSCI-605 or CSCI-604) and (CSCI-661 or	CSCI 790 Computer Science MS Thesis	6		Permission of thesis committee and graduate program

		CSCI-660) with grades of B or better. Prerequisite may also be satisfied by successful completion of (CSCI-243 or 4003-334) and (CSCI-262 or CSCI-263).				coordinator
CSCI 799 Computer Science Graduate Independent Study	3	Permission of instructor and department				
Term credit total:	9		Term credit total:	9		

(5) Students may also elect to take four Computer Science courses in the fall in order to leave more time to complete their thesis in the spring.

(6) Students who elect to do a project instead of a thesis in year 6 will be required to take an additional graduate Computer Science elective.

Students enrolled in the BS/MS program will be allowed to enroll in graduate level Computer Science courses during term 'fall 6' even if they have not yet completed all of their degree requirements for the BS degree.

Students, however, must complete all of their degree requirements for the BS degree before being permitted to register for CSCI 790 Computer Science MS Thesis (and the same would apply to those students who elect to complete CSCI 788 Computer Science MS Project).