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The Goodwin College of Professional Studies: Undergraduate and Graduate Programs

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The Richard C. Goodwin College of Professional Studies

The mission of the Goodwin College of Professional Studies is to provide contemporary students with the academic foundation and practical education that meets their career aspirations and facilitates their professional and personal advancement.

While still serving a large adult, part-time student population, the College has grown into a distinct entity that creates and delivers programs that are professional and applied in nature for both full-time traditional and nontraditional students. Today, the College offers full-time and part-time programs, credit and non-credit courses, classes during the day, evening, Saturdays, and online—as well as programs designed to suit the needs of the corporate sector.

The College also provides a range of continuing adult and professional education programs, certificates of proficiency, licensing and certification test preparation, and customer contracted training. The College abides by the continuing education unit (CEU) criteria for quality education.

All Goodwin programs are unique, aligning with market and industry needs, and blending theory with practice through laboratory experiments, field trips, and solid alliances with key businesses and industries. Instruction at Goodwin is supported by a team of educators with noteworthy educational credentials and expertise, and varied industrial background.

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The Richard C. Goodwin College of Professional Studies

The College offers several degree completion options to students with busy schedules or wishing to complete previous studies.

Accelerated Degree Programs
These programs are designed for people who already have earned an associate's degree or equivalent and for working adults and professionals. The types of programs available are listed below:

- Corporate onsite degree completion
- Saturday Scholars Degree Completion Program

Part-time Evening Studies
The College offers several partnership programs with other colleges and schools at the University. These degree programs are housed in the respective day departments, and are offered in the evening for students who cannot attend classes during the day. However, many of these degree programs may require courses during the day. Detailed program descriptions and curriculum requirements may be found by visting the College's Part-Time Undergraduate Studies web page.

Off-site Programs
The Goodwin College brings high quality Drexel courses and faculty members to your facility, offering your employees an exceptional and convenient education. Through Drexel, companies may choose to offer their employees programs and certificates at their place of work. The College works seamlessly with organizations to provide the support and training that their employees want and that management needs in order to maintain a competitive edge in their industry.
A Drexel education is a benefit that makes sense for both employers and employees. It enhances an organization's reputation, improves employee retention rates, and makes for a skilled and talented workforce.
Visit http://www.drexel.edu/goodwin/ for more information.

Drexel University and Burlington County College (BCC) programs
Drexel University and Burlington County College (BCC) have joined together to create a unique educational opportunity: Drexel at BCC. This partnership enables BCC students to earn a bachelor's degree from Drexel University while remaining on BCC's Mount Laurel campus.

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Architecture - Part-time Evening Program

Part-time Evening Curriculum
The program, offered entirely in the evening, leads to a Bachelor of Architecture degree.The program is structured into three areas of study: the studio/thesis sequence; required and elective architectural coursework; and required university coursework.

Calendar
The course of study usually takes seven years to complete, but students with transfer credits in studio design can accelerate their program. Students are expected to supplement their academic work through full-time employment in architectural offices.The studio courses and most required professional courses are offered in sequences during the fall, winter and spring quarters. Elective courses and required university courses are available during the summer quarter.|

Transfer Credits
It is possible to transfer into the architecture program at Drexel. Transfer credit for comparable courses completed at accredited institutions will be awarded if grades of C or higher have been earned. Placement and credit in studio design courses will depend on a portfolio review of the students' academic design projects. In general advanced placement in design is awarded when students have successfully completed comparable studios in B.Arch. programs or in recognized pre-architecture transfer programs.

Advisement and Departmental Regulations
Please refer to the department's General Counseling Guidelines to the Curriculum for a complete description of all departmental regulations and procedures, and for advice in selecting, sequencing, and scheduling coursework. These guidelines are available at the Office of the Department of Architecture at 3201 Arch Street.

Accreditation
The Bachelor of Architecture degree program at Drexel is accredited by the National Architectural Accrediting Board (NAAB).

In the United States, most state registration boards require a degree from an accredited professional degree program as a prerequisite for licensure. The National Architectural Accrediting Board (NAAB), which is the sole agency authorized to accredit U.S. professional degree programs in architecture, recognizes three types of degrees: the Bachelor of Architecture, the Master of Architecture, and the Doctor of Architecture. A program may be granted a six-year, three-year, or two-year term of accreditation, depending on its degree of conformance with established educational standards.

Master's degree programs may consist of a preprofessional undergraduate degree and a professional graduate degree, which, when earned sequentially, comprise an accredited professional education. However, the preprofessional degree is not, by itself, recognized as an accredited degree.

Architecture vs Architectural Engineering

Because Drexel university offers two programs with "architecture" in their titles, it is useful to point out the significant differences between them:

Architects design buildings to meet people's spatial, organizational, and aesthetic needs; they also coordinate the building design process. After earning a Bachelor of Architecture Degree, graduates become registered architects by completing the required work experience and state licensing examinations.

Architectural Engineers specialize in the design of engineering systems within buildings. Architectural Engineers earn Bachelor of Science Degrees and become professional engineers with the required experience and state examinations. Students whose interests are focused on the technological and engineering aspects of buildings should review Drexel's major in Architectural Engineering offered by the College of Engineering.

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Architecture

The Part-Time Evening Program
The Part-Time Evening Program leads to a Bachelor of Architecture degree. The course of study usually takes seven years to complete, but students with transfer credits in studio design can accelerate their program. Since all courses are offered in the evening, students are expected to supplement their academic work with full-time employment in architectural offices. Please contact the Department of Architecture at 215-895-2409 for further information.

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Architecture: Part-Time Evening Program
Bachelor of Architecture Degree: 221.0 credits.

Degree Requirements

Required courses

General education requirements		Credits
ENGL 101	**Expository Writing and Reading**	3.0
ENGL 102	**Persuasive Writing and Reading**	3.0
ENGL 103	**Analytical Writing and Reading**	3.0
MATH 181	**Mathematical Analysis I**	3.0
MATH 182	**Mathematical Analysis II**	3.0
MATH 183	**Mathematical Analysis III**	3.0
PHYS 182	**Applied Physics I**	3.0
PHYS 183	**Applied Physics II**	3.0
PHYS 184	**Applied Physics III**	3.0
	Humanities electives*	9.0
	Social science electives	9.0
	Free electives	24.0

*One humanities elective should be a PHIL course addressing Ethics for Architects.

Departmental requirements		Credits
ARCH 111	**Studio 1-1**	3.0
ARCH 112	**Studio 1-2**	3.0
ARCH 113	**Studio 1-3**	3.0
ARCH 121	**Studio 2-1**	3.0
ARCH 122	**Studio 2-2**	3.0
ARCH 123	**Studio 2-3**	3.0
ARCH 231	**Studio 3-1***	3.0
ARCH 232	**Studio 3-2**	3.0
ARCH 233	**Studio 3-3**	3.0
ARCH 241	**Studio 4-1**	4.0
ARCH 242	**Studio 4-2**	4.0
ARCH 243	**Studio 4-3**	4.0
ARCH 351	**Studio 5-1**	4.0

ARCH 352	**Studio 5-2**	4.0
ARCH 353	**Studio 5-3**	4.0
ARCH 361	**Studio 6-1***	4.0
ARCH 362	**Studio 6-2**	4.0
ARCH 363	**Studio 6-3**	4.0
ARCH 496	**Thesis I**	8.0
ARCH 497	**Thesis II**	8.0
ARCH 498	**Thesis III**	8.0

*Prior to taking this course student must meet the Department of Architecture's minimum studio advancement requirements. See the Department's Advising Guidelines web page page for more details.

Required professional courses		**Credits**
ARCH 14I	**Architecture and Society I**	3.0
ARCH 142 WI	**Architecture and Society II**	3.0
ARCH 143 WI	**Architecture and Society III**	3.0
ARCH 150	**Introduction to CADD I**	4.0
ARCH 153	**Introduction to CADD II**	4.0
ARCH 155	**Basic Architectural Drawing**	3.0
ARCH 156	**Graphic Communication I**	3.0
ARCH 161	**Architectural Construction**	3.0
ARCH 261	**Environmental Systems I**	3.0
ARCH 262	**Environmental Systems II**	3.0
ARCH 263	**Environmental Systems III**	3.0
CIVE 261	**Materials and Structural Behavior I**	3.0
CIVE 262	**Materials and Structural Behavior II**	3.0
CIVE 263	**Materials and Structural Behavior III**	3.0

History and theory electives		**12.0 Credits**
Three or four of the following courses		
ARCH 341	**Theories of Architecture I**	3.0
ARCH 342	**Theories of Architecture II**	3.0
ARCH 343	**Theories of Architecture III**	3.0
ARCH 344	**History of the Modern Movement I**	3.0
ARCH 345	**History of the Modern Movement II**	3.0
ARCH 346	**History of Philadelphia Architecture**	3.0
ARCH 347	**Summer Study Abroad (6 credits)**	6.0
ARCH 348	**Studies in Vernacular Architecture**	3.0
ARCH 421 WI	**Environmental Psychology and Design Theory**	3.0
ARCH 441	**Urban Design Seminar I**	3.0
ARCH 442	**Urban Design Seminar II**	3.0
ARCH 499	**Special Topics in Architecture**	3.0

Professional electives		Credits
Any three of the following courses*		
ARCH 157	**Graphic Communication II**	3.0
ARCH 431	**Architectural Programming**	3.0
ARCH 432	**The Development Process**	3.0
ARCH 435	**Management Seminar I**	3.0
ARCH 436	**Management Seminar II**	3.0
ARCH 451	**Advanced Drawing**	3.0
ARCH 455	**Computer Applications in Architecture I**	3.0
ARCH 456	**Computer Applications in Architecture II**	3.0
ARCH 461	**Technology Seminar I**	3.0
ARCH 462	**Technology Seminar II**	3.0
ARCH 465	**Energy and Architecture**	3.0
ARCH 499	**Special Topics in Architecture**	3.0
CIVE 400	**Structural Design I**	3.0
CIVE 401	**Structural Design II**	3.0
CIVE 402	**Structural Design III**	3.0
CIVE 464	**Acoustics and Noise Control in Buildings I**	3.0
CMGT 462	**Construction Management I**	3.0
CMGT 463	**Value Engineering II**	3.0
CMGT 363	**Estimating I**	3.0

* History and theory electives taken beyond the 12 credits required can also be used to satisfy professional elective requirements.

Writing-Intensive Course Requirements
In order to graduate, all students beginning with the entering class of 2002/01 (fall, 2002) must pass three writing-intensive courses after their freshman year. Two writing-intensive courses must be in a student's major. The third can be in any discipline. Students are advised to take one writing-intensive class each year, beginning with the sophomore year, and to avoid "clustering" these courses near the end of their matriculation. Transfer students need to meet with an academic advisor to review the number of writing-intensive courses required to graduate.

A "WI" next to a course in this catalog indicates that this course can fulfill a writing-intensive requirement. Departments will designate specific sections of such courses as writing-intensive. Sections of writing-intensive courses are not indicated in this catalog. Students should check the section comments in Banner when registering. Students scheduling their courses in Banner can also conduct a search for courses with the attribute "WI" to bring up a list of all writing-intensive courses available that term. For more information on writing-intensive courses, see the Drexel University Writing Program's Writing-Intensive Course page.

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Architecture

Bachelor of Architecture Degree: 221.0 credits

Part-time Evening Program

Recommended Plan of Study:
This curriculum format is adjustable to each student's academic situation. Transfer credit evaluation, prior architectural experience, and other considerations may restructure the student's yearly program schedul**e.**

First year

Fall Quarter		Credits
ARCH 111	Studio 1-1	3.0
ARCH 155	Basic Architectural Drawing	3.0
ENGL 101	Expository Writing and Reading	3.0
Winter Quarter		
ARCH 112	Studio 1-2	3.0
ARCH 156	Graphic Communication I	3.0
ENGL 102	Persuasive Writing and Reading	3.0
Spring Quarter		
ARCH 113	Studio 1-3	3.0
ARCH 161	Architecture Construction	3.0
ENGL 103	Techniques of Analysis Evaluation	3.0
Summer Quarter		
ARCH 150	Introduction to CADD I	4.0
	Humanities elective	3.0
	Total credits	34.0

Second year

Fall Quarter		Credits
ARCH 121	Studio 2-1	3.0
ARCH 14I WI	Architecture and Society I	3.0
MATH 181	Mathematical Analysis I	3.0
Winter Quarter		
ARCH 122	Studio 2-2	3.0
ARCH 142 WI	Architecture and Society II	3.0
MATH 183	Mathematical Analysis II	3.0

	Spring Quarter	
ARCH 123	**Studio 2-3**	3.0
ARCH 143 WI	**Architecture and Society III**	3.0
MATH 182	**Mathematical Analysis III**	3.0
	Summer Quarter	
ARCH 153	**Introduction to CADD II**	4.0
	Social science elective	3.0
	Total credits	34.0

Third year

Fall Quarter		Credits
ARCH 231	**Studio 3-1***	3.0
PHYS 182	**Applied Physics I**	3.0
	Social science elective	3.0
Winter Quarter		
ARCH 232	**Studio 3-2**	3.0
PHYS 183	**Applied Physics II**	3.0
	Humanities elective	3.0
Spring Quarter		
ARCH 233	**Studio 3-3**	3.0
PHYS 184	**Applied Physics III**	3.0
	Humanities elective	3.0
	Total credits	27.0

*Prior to taking this course student must meet the Department of Architecture's minimum studio advancement requirements. See the Department's Advising Guidelines web page page for more details.

	Summer Quarter	
	History/Theory elective	3.0
	Social science elective	3.0
	Free elective	3.0
	Total credits	36.0

Fourth year

Fall Quarter		Credits
ARCH 241	**Studio 4-1**	4.0
CIVE 261	**Materials and Structural Behavior I**	3.0
Winter Quarter		
ARCH 242	**Studio 4-2**	4.0
CIVE 262	**Materials and Structural Behavior II**	3.0
Spring Quarter		
ARCH 243	**Studio 4-3**	4.0
CIVE 263	**Materials and Structural Behavior III**	3.0
Summer Quarter		
	History/Theory elective	3.0
	Professional elective	3.0
	Free elective	3.0

	Total credits	30.0

Fifth year

Fall Quarter		Credits
ARCH 351	**Studio 5-1**	4.0
ARCH 261	**Environmental Systems I**	3.0
Winter Quarter		
ARCH 352	**Studio 5-2**	4.0
ARCH 262	**Environmental Systems II**	3.0
Spring Quarter		
ARCH 353	**Studio 5-3**	4.0
ARCH 263	**Environmental Systems III**	3.0
Summer Quarter		
	History/Theory elective	3.0
	Professional elective	3.0
	Free elective	3.0
	Total credits	27.0

Sixth year

Fall Quarter		Credits
ARCH 361	**Studio 6-1***	4.0
	Free elective	3.0
Winter Quarter		
ARCH 362	**Studio 6-2**	4.0
	Social science elective	3.0
Spring Quarter		
ARCH 363	**Studio 6-3**	4.0
PHIL	**Ethics for Architects**	3.0
Summer Quarter		
	Professional elective	3.0
	Free elective	3.0
	Total credits	27.0

*Prior to taking this course student must meet the Department of Architecture's minimum studio advancement requirements. See the Department's Advising Guidelines web page page for more details.

Seventh year (Thesis)

Fall Quarter		Credits
ARCH 496	**Thesis I**	8.0
	History/Theory elective	3.0
Winter Quarter		
ARCH 497	**Thesis II**	8.0
	Free elective	3.0
Spring Quarter		
ARCH 498	**Thesis III**	8.0

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Applied Engineering Technology

The Bachelor of Science (B.S.) degree in Applied Engineering Technology provides an integrated educational experience directed toward development of the ability to apply fundamental knowledge to the solution of practical technological problems.

All students enrolled in the program are required to take general education courses including mathematics, the sciences and liberal arts. During their sophomore year, students need to choose one of the three available concentrations, namely electrical, manufacturing, or mechanical engineering technology. These concentrations consist of core fundamental courses, technical electives, free electives and a three-term senior design project reflecting industrial practices.

The AET program distinguishes itself from traditional engineering programs by placing emphasis on the application of theory, by integrating most courses with laboratory experience, and by incorporating faculty with extensive industrial experience.

The AET program includes full-time and part-time enrollment options. Students pursuing the full-time option can opt for a four-year program with a six-month internship or a five-year program with an eighteen-month co-op period.

Applied engineering technology graduates are uniquely qualified to serve in a variety of functions requiring traditional and nontraditional technological skills. The program also prepares students for graduate study in a variety of fields including engineering management, business administration, and health technology.

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Applied Engineering Technology
Manufacturing Engineering Technology Concentration

Bachelor of Science Degree: 187.5 credits

Required courses

Humanities and social sciences requirements		34.0 Credits
ENGL 101	Expository Writing and Reading	3.0
ENGL 102	Persuasive Writing and Reading	3.0
ENGL 103	Analytical Writing and Reading	3.0
COM 111	Introduction to Corporate Communication	3.0
COM 230	Principles of Speech	3.0
ECON 201	Microeconomics	4.0
HIST 285	Technology in Historical Perspective	3.0
PHIL 315	Engineering Ethics	3.0
	Liberal studies electives	9.0

Basic Science requirements		14.5 Credits
CHEM 111	General Chemistry I	4.0
CHEM 113	Chemistry Laboratory I	1.5
PHYS 152	Physics for Life Sciences I	4.5
PHYS 153	Physics for Life Sciences II	4.5

Mathematics requirements		15.0 Credits
MATH 110	Precalculus	3.0
MATH 121	Calculus and Analytic Geometry I	4.0
MATH 122	Calculus and Analytic Geometry II	4.0
STAT 201	Statistics I	4.0

Applied Engineering Technical Core		62.0 Credits
EET 201	Circuit Analysis I	4.0
EET 202	Circuit Analysis II	4.0
EET 203	Non-Destructive Evaluation of Materials	4.0

EET 204	Introduction to Nanotechnology	4.0
EET 205	Digital Electronics with Laboratory	4.0
EET 311	Modeling of Engineering Systems	4.0
EET 319	Programmable Logic Controllers	4.0
EET 401	Applied Micro-controllers	3.0
MET 100	Graphical Communication	4.0
MET 101	Manufacturing Materials	4.0
MET 204	Quality Control	3.0
MET 205	Robotics and Mechatronics	3.0
MET 209	Fluid Power	3.0
MET 213	Applied Mechanics	4.0
MHT 205	Thermodynamics I	3.0
MHT 226	Measurement Lab	3.0
CIVE 240	Engineering Economics	3.0
INDE 370	Industrial Project Management	3.0

MET Concentration requirements		24.0 Credits
MET 201	Introduction to Manufacturing Industries	3.0
MHT 201	Kinematics	3.0
MET 313	Machine Tool Processing	3.0
MET 316	Computer Numerical Control	3.0
MET 407	Manufacturing Processes	3.0
MET 408	Manufacturing Information Management	3.0
MET 310	Advanced Robotics/Mechatronics	3.0
MET 411	Advanced Computer Numerical Control	3.0

MET Technical electives		6.0 Credits

Students select 6.0 credits from the following courses:

MET 301	Advanced Design Graphics	3.0
MET 402	Manufacturing Design w/CAD	3.0
MET 403	Three Dimensional Modeling	3.0
MET 404	Digital Instrumentation	3.0
MET 409	Green Manufacturing	3.0
MET 380	Special Topics in Manufacturing Engineering Technology	2.0

Capstone course requirements		9.0 Credits
MET 421	Project Design I	3.0
MET 422	Project Design II	3.0
MET 423	Project Design III	3.0

Miscellaneous		8.0 Credits
CS 161	**Introduction to Computing**	3.0
EET 102	**Introduction to AET**	2.0
UNIV 101	**The Drexel Experience**	2.0

Free electives	**15.0 Credits**

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Recommended Plan Of Study

BS Applied Engineering Technology
5 YR UG Co-op Concentration /Manufacturing Engineering Tech

Term 1		Credits
CHEM 111	General Chemistry I	4.0
CHEM 113	General Chemistry I Laboratory	1.5
EET 102	Introduction to Applied Engineering Technology	3.0
ENGL 101	Expository Writing and Reading	3.0
MATH 110	Precalculus	3.0
PHYS 152	Physics for Life Sciences I	4.5
UNIV 101	The Drexel Experience	1.0
	Term Credits	*20.0*

Term 2		Credits
ENGL 102	Persuasive Writing and Reading	3.0
MATH 121	Calculus I	4.0
MET 100	Graphical Communication	4.0
PHYS 153	Physics for Life Sciences II	4.5
UNIV 101	The Drexel Experience	1.0
	Term Credits	*16.5*

Term 3		Credits
CS 161	Introduction to Computing	3.0
EET 201	Circuit Analysis I	4.0
ENGL 103	Analytical Writing and Reading	3.0
MATH 122	Calculus II	4.0
MET 101	Manufacturing Materials	4.0
	Term Credits	*18.0*

Term 4		Credits
COM 111	Principles of Communication	3.0
EET 202	Circuit Analysis II	4.0
EET 205	Digital Electronics with Laboratory	4.0
MHT 226	Measurement Lab	3.0
STAT 201	Business Statistics I	4.0
	Term Credits	*18.0*

Term 5		Credits
EET 203	Non-Destructive Evaluation of Materials	3.0
EET 204	Introduction to Nanotechnology	3.0
HIST 285	Technology in Historical Perspective	3.0
MET 205	Robotics and Mechatronics	3.0
MHT 205	Thermodynamics I	3.0
	Term Credits	*15.0*

Term 6		Credits
COM 230	Techniques of Speaking	3.0
ECON 201	Economics I	4.0
EET 311	Modeling of Engineering Systems	4.0
EET 319	PLC Fundamentals	4.0
MET 213	Applied Mechanics	4.0
	Term Credits	*19.0*

Term 7		Credits
CIVE 240	Engineering Economic Analysis	3.0

EET 401	Applied Micro-controllers	3.0
MET 204	Applied Quality Control	3.0
MET 209	Fluid Power	3.0
PHIL 315	Engineering Ethics	3.0
	Term Credits	*15.0*

Term 8		Credits
MET 201	Introduction to Mfg Processes	3.0
MET 203	Machine Tool Processing	4.0
MHT 201	Kinematics	3.0
	Free elective	3.0
	Term Credits	*13.0*

Term 9		Credits
INDE 370	Industrial Project Management	3.0
MET 310	Advanced Robotics and Mechatronics	3.0
MET 316	Computer Numerical Control	3.0
MET 407	Manufacturing Processes	3.0
MET 408	MFG Information Management	3.0
	Term Credits	*15.0*

Term 10		Credits
MET 411	Advanced Computer Numerical Control	3.0
MET 421	Senior Design Project I	3.0
	Free elective	3.0
	Liberal studies elective	4.0
	Term Credits	*13.0*

Term 11		Credits
MET 422	Senior Design Project II	3.0
	Free electives	6.0
	Liberal studies elective	3.0
	MET technical elective (See degree requirements for options)	3.0
	Term Credits	*15.0*

Term 12		Credits
MET 423	Senior Design Project III	3.0
	Free elective	3.0
	Liberal studies elective	3.0
	MET technical elective (See degree requirements for options)	3.0
	Term Credits	*12.0*

	Total Credits (minimum)	189.5

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Applied Engineering Technology
Electrical Engineering Technology Concentration

Bachelor of Science Degree: 187.5 credits

Required courses

Humanities and social sciences requirements		34.0 Credits
ENGL 101	Expository Writing and Reading	3.0
ENGL 102	Persuasive Writing and Reading	3.0
ENGL 103	Analytical Writing and Reading	3.0
COM 111	Introduction to Corporate Communication	3.0
COM 230	Principles of Speech	3.0
ECON 201	Microeconomics	4.0
HIST 285	Technology in Historical Perspective	3.0
PHIL 315	Engineering Ethics	3.0
	Liberal studies electives	9.0

Basic Science requirements		14.5 Credits
CHEM 111	General Chemistry I	4.0
CHEM 113	Chemistry Laboratory I	1.5
PHYS 152	Physics for Life Sciences I	4.5
PHYS 153	Physics for Life Sciences II	4.5

Mathematics requirements		15.0 Credits
MATH 110	Precalculus	3.0
MATH 121	Calculus and Analytic Geometry I	4.0
MATH 122	Calculus and Analytic Geometry II	4.0
STAT 201	Statistics I	4.0

Applied Engineering Technical Core		62.0 Credits
EET 201	Circuit Analysis I	4.0
EET 202	Circuit Analysis II	4.0
EET 203	Non-Destructive Evaluation of Materials	4.0

EET 204	Introduction to Nanotechnology	4.0
EET 205	Digital Electronics with Laboratory	4.0
EET 311	Modeling of Engineering Systems	4.0
EET 319	Programmable Logic Controllers	4.0
EET 401	Applied Micro-controllers	3.0
MET 100	Graphical Communication	4.0
MET 101	Manufacturing Materials	4.0
MET 204	Applied Quality Control	3.0
MET 205	Automation & Computer Assisted Machine Systems	3.0
MET 104	Fluid Power	3.0
MET 103	Applied Mechanics	4.0
MHT 205	Thermodynamics I	3.0
MHT 226	Measurement Lab	3.0
CIVE 240	Engineering Economics	3.0
INDE 370	Industrial Project Management	3.0

EET Concentration requirements		26.0 Credits
EET 206	Analog Electronics I	4.0
EET 313	Signals and Systems I	4.0
EET 317	Analog Electronics II	4.0
EET 322	Energy Conversion	4.0
EET 323	Electrical Systems Design	3.0
EET 324	Power Electronics	4.0
EET 325	Microprocessors	3.0

EET Technical electives		6.0 Credits

Students select 6.0 credits from the following courses:

EET 402	Control Engineering	3.0
EET 404	Signals and Systems II	3.0
EET 406	Communications	3.0
EET 407	Power Systems	3.0
EET 409	Optical System Design	3.0
MHT 295	Plasma Laboratory	2.0

Capstone course requirements		9.0 Credits
MET 421	Project Design I	3.0
MET 422	Project Design II	3.0
MET 423	Project Design III	3.0

Miscellaneous		**8.0 Credits**
CS 161	**Introduction to Computing**	3.0
EET 102	**The Drexel Experience**	2.0
UNIV 101	**The Drexel Experience**	2.0

Free electives	**13.0 Credits**

Recommended Plan Of Study

BS Applied Engineering Technology
5 YR UG Co-op Concentration /Electrical Engineering Tech.

Term 1		Credits
CHEM 111	General Chemistry I	4.0
CHEM 113	General Chemistry I Laboratory	1.5
EET 102	Introduction to Applied Engineering Technology	3.0
ENGL 101	Expository Writing and Reading	3.0
MATH 110	Precalculus	3.0
PHYS 152	Physics for Life Sciences I	4.5
UNIV 101	The Drexel Experience	1.0
	Term Credits	*20.0*

Term 2		Credits
ENGL 102	Persuasive Writing and Reading	3.0
MATH 121	Calculus I	4.0
MET 100	Graphical Communication	3.0
PHYS 153	Physics for Life Sciences II	4.5
UNIV 101	The Drexel Experience	1.0
	Term Credits	*15.5*

Term 3		Credits
CS 161	Introduction to Computing	3.0
EET 201	Circuit Analysis I	4.0
ENGL 103	Analytical Writing and Reading	3.0
MATH 122	Calculus II	4.0
MET 101	Manufacturing Materials	4.0
	Term Credits	*18.0*

Term 4		Credits
COM 111	Introduction to Corporate Communication	3.0
EET 202	Circuit Analysis II	4.0
EET 205	Digital Electronics with Laboratory	4.0
MHT 226	Measurement Lab	3.0
STAT 201	Business Statistics I	4.0
	Term Credits	*18.0*

Term 5		Credits
EET 203	Non-Destructive Evaluation of Materials	3.0
EET 204	Introduction to Nanotechnology	3.0
HIST 285	Technology in Historical Perspective	3.0
MET 205	Automation and Computer-Integrated Manufacturing	4.0
MHT 205	Thermodynamics I	3.0
	Term Credits	*16.0*

Term 6		Credits
COM 230	Techniques of Speaking	3.0
ECON 201	Economics I	4.0
EET 311	Modeling of Engineering Systems	4.0
EET 319	Programmable Logic Controllers	4.0
MET 103	Applied Mechanics	4.0
	Term Credits	*19.0*

Term 7		Credits
CIVE 240	Engineering Economic Analysis	3.0

EET 401	Applied Micro-controllers	3.0
MET 104	Fluid Power	4.0
MET 204	Applied Quality Control	4.0
PHIL 315	Engineering Ethics	3.0
	Term Credits	*17.0*

Term 8		Credits
EET 206	Analog Electronics I	4.0
EET 322	Energy Conversion	4.0
EET 325	Microprocessors	3.0
	Free elective	3.0
	Term Credits	*14.0*

Term 9		Credits
EET 313	Signals and Systems I	4.0
EET 317	Analog Electronics II	4.0
EET 323	Electrical Systems Design	3.0
INDE 370	Industrial Project Management	3.0
	Term Credits	*14.0*

Term 10		Credits
EET 324	Power Electronics	4.0
MET 421	Senior Design Project I	3.0
	Free elective	3.0
	Liberal studies elective	3.0
	Term Credits	*13.0*

Term 11		Credits
MET 422	Senior Design Project II	3.0
	EET technical elective (See degree requirements for options)	3.0
	Free elective	3.0
	Liberal studies elective	3.0
	Term Credits	*12.0*

Term 12		Credits
MET 423	Senior Design Project III	3.0
	EET technical elective (See degree requirements for options)	3.0
	Free elective	2.0
	Liberal studies elective	3.0
	Term Credits	*11.0*

	Total Credits (minimum)	187.5

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Applied Engineering Technology
Mechanical Engineering Technology Concentration

Bachelor of Science Degree: 187.5 credits

Required courses

Humanities and social sciences requirements		**34.0 Credits**
ENGL 101	**Expository Writing and Reading**	3.0
ENGL 102	**Persuasive Writing and Reading**	3.0
ENGL 103	**Analytical Writing and Reading**	3.0
COM 111	**Introduction to Corporate Communication**	3.0
COM 230	**Principles of Speech**	3.0
ECON 201	**Microeconomics**	4.0
HIST 285	**Technology in Historical Perspective**	3.0
PHIL 315	**Engineering Ethics**	3.0
	Liberal studies electives	9.0

Basic Science requirements		**14.5 Credits**
CHEM 111	**General Chemistry I**	4.0
CHEM 113	**Chemistry Laboratory I**	1.5
PHYS 152	**Physics for Life Sciences I**	4.5
PHYS 153	**Physics for Life Sciences II**	4.5

Mathematics requirements		**15.0 Credits**
MATH 110	**Precalculus**	3.0
MATH 121	**Calculus and Analytic Geometry I**	4.0
MATH 122	**Calculus and Analytic Geometry II**	4.0
STAT 201	**Statistics I**	4.0

Applied Engineering Technical Core		**62.0 Credits**
EET 201	**Circuit Analysis I**	4.0
EET 202	**Circuit Analysis II**	4.0

EET 203	**Non-Destructive Evaluation of Materials**	4.0
EET 204	**Introduction to Nanotechnology**	4.0
EET 205	**Digital Electronics with Laboratory**	4.0
EET 311	**Modeling of Engineering Systems**	4.0
EET 319	**Programmable Logic Controllers**	4.0
EET 401	**Applied Micro-controllers**	3.0
MET 100	**Graphical Communication**	4.0
MET 101	**Manufacturing Materials**	4.0
MET 204	**Applied Quality Control**	3.0
MET 205	**Automation & Computer Assisted Machine Systems**	3.0
MET 204	**Fluid Power**	3.0
MET 103	**Applied Mechanics**	4.0
MHT 205	**Thermodynamics I**	3.0
MHT 226	**Measurement Lab**	3.0
CIVE 240	**Engineering Economics**	3.0
INDE 370	**Industrial Project Management**	3.0

		26.0 Credits
MHT Concentration requirements		
MHT 201	**Kinematics**	3.0
MHT 206	**Thermodynamics II**	3.0
MHT 222	**Applied Dynamics**	3.0
MHT 301	**Fluid Mechanics I**	3.0
MHT 314	**Thermo and Heath Transfer Laboratory**	3.0
MHT 401	**Mechanical Design I**	4.0
MHT 402	**Mechanical Design II**	4.0
MET 313	**Machine Tool Processing**	3.0

	6.0 Credits
EET Technical electives	

Students select 6.0 credits from the following courses:

MHT 224	**Applied Dynamics II**	3.0
MHT 403	**Fluid Mechanics II**	4.0
MHT 404	**Advanced Materials**	4.0
MHT 405	**HVAC**	4.0
MHT 295	**Environmental Control Plasma Lab**	2.0

	9.0 Credits
Capstone course requirements	

MET 421	**Project Design I**	3.0
MET 422	**Project Design II**	3.0
MET 423	**Project Design III**	3.0

Miscellaneous		8.0 Credits
CS 161	Introduction to Computing	3.0
EET 102	The Drexel Experience	2.0
UNIV 101	The Drexel Experience	2.0

Free electives		13.0 Credits

Recommended Plan Of Study

BS Applied Engineering Technology
5 YR UG Co-op Concentration /Mechanical Engineering Tech.

Term 1		Credits
CHEM 111	General Chemistry I	4.0
CHEM 113	General Chemistry I Laboratory	1.5
EET 102	Introduction to Applied Engineering Technology	3.0
ENGL 101	Expository Writing and Reading	3.0
MATH 110	Precalculus	3.0
PHYS 152	Physics for Life Sciences I	4.5
UNIV 101	The Drexel Experience	1.0
	Term Credits	*20.0*

Term 2		Credits
ENGL 102	Persuasive Writing and Reading	3.0
MATH 121	Calculus I	4.0
MET 100	Graphical Communication	4.0
PHYS 153	Physics for Life Sciences II	4.5
UNIV 101	The Drexel Experience	1.0
	Term Credits	*16.5*

Term 3		Credits
CS 161	Introduction to Computing	3.0
EET 201	Circuit Analysis I	4.0
ENGL 103	Analytical Writing and Reading	3.0
MATH 122	Calculus II	4.0
MET 101	Manufacturing Materials	4.0
	Term Credits	*18.0*

Term 4		Credits
COM 111	Principles of Communication	3.0
EET 202	Circuit Analysis II	4.0
EET 205	Digital Electronics with Laboratory	4.0
MHT 226	Measurement Lab	3.0
STAT 201	Business Statistics I	4.0
	Term Credits	*18.0*

Term 5		Credits
EET 203	Non-Destructive Evaluation of Materials	3.0
EET 204	Introduction to Nanotechnology	3.0
HIST 285	Technology in Historical Perspective	3.0
MET 205	Robotics and Mechatronics	3.0
MHT 205	Thermodynamics I	3.0
	Term Credits	*15.0*

Term 6		Credits
COM 230	Techniques of Speaking	3.0
ECON 201	Economics I	4.0
EET 311	Modeling of Engineering Systems	4.0
EET 319	Programmable Logic Controllers	4.0
MET 103	Applied Mechanics	4.0
	Term Credits	*19.0*

Term 7		Credits
CIVE 240	Engineering Economic Analysis	3.0

EET 401	**Applied Micro-controllers**	**3.0**
MET 204	**Applied Quality Control**	**3.0**
MET 209	**Fluid Power**	**3.0**
PHIL 315	**Engineering Ethics**	**3.0**
	Term Credits	*15.0*

Term 8		Credits
MET 313	**Machine Tool Processing**	**3.0**
MHT 201	**Kinematics**	**3.0**
MHT 206	**Thermodynamics II**	**3.0**
MHT 222	**Applied Dynamics I**	**3.0**
MHT 301	**Fluid Mechanics I**	**3.0**
	Term Credits	*15.0*

Term 9		Credits
INDE 370	**Industrial Project Management**	**3.0**
MHT 314	**Thermo and Heat Transfer Lab**	**3.0**
MHT 401	**Mechanical Design I**	**4.0**
	Free elective	**3.0**
	Term Credits	*13.0*

Term 10		Credits
MET 421	**Senior Design Project I**	**3.0**
MHT 210	**Mechanical Design II**	**4.0**
	Free elective	**4.0**
	Liberal studies elective	**3.0**
	Term Credits	*14.0*

Term 11		Credits
MET 422	**Senior Design Project II**	**3.0**
	Free elective	**3.0**
	Liberal studies elective	**3.0**
	MHT technical elective (See degree requirements for options)	**3.0**
	Term Credits	*12.0*

Term 12		Credits
MET 423	**Senior Design Project III**	**3.0**
	Free elective	**3.0**
	Liberal studies elective	**3.0**
	MHT technical elective (See degree requirements for options)	**3.0**
	Term Credits	*12.0*

	Total Credits (minimum)	**187.5**

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Construction Management

Construction management is a dynamic profession that is a combination of art and science.While an understanding of the technical aspects of construction is extremely important, it is also essential that construction professionals have knowledge of the business and management aspects of the profession.While construction has traditionally been a very conservative industry, the increasing rate of technological development and competition in the industry serves to accelerate the development of new construction methods, equipment, materials, and management techniques. As a result of these forces, there is an increasing need for innovative and professionally competent construction professionals. Students in this program receive broad academic, technical, business, and construction management courses that are designed to produce these well-rounded construction professionals.

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Construction Management

Bachelor of Science Degree: 180.5 credits

Required courses

English requirements		**9.0 Credits**
ENGL 101	**Expository Writing and Reading**	3.0
ENGL 102	**Persuasive Writing and Reading**	3.0
ENGL 103	**Analytical Writing and Reading**	3.0

Mathematics requirements		**11.0 Credits**
MATH 101	**Math Analysis I**	4.0
MATH 102	**Math Analysis II**	4.0

Science requirements		**18.5 Credits**
CHEM 101	**General Chemistry I**	3.5
CHEM 102	**General Chemistry II**	4.5
CHEM 113	**Chemistry Laboratory I**	1.5
PHYS 182	**Applied Physics I**	3.0
PHYS 183	**Applied Physics II**	3.0
PHYS 184	**Applied Physics III**	3.0

Business requirements		**28.0 Credits**
ACCT 115	**Financial Accounting**	4.0
BLAW 201	**Business Law I**	4.0
ECON 201	**Economics I**	4.0
ECON 202	**Economics II**	4.0
FIN 301	**Introduction to Finance**	4.0
STAT 201	**Statistics I**	4.0
STAT 202	**Statistics II**	4.0

/Humanities and social science requirements	17.0 Credits
Humanities and social science electives	

Professional core requirements	82.0 Credits
CIVE 240 **Engineering Economics**	3.0
CIVE 251 **Engineering Surveying**	3.0
CMGT 101 **Introduction to Construction Management**	3.0
CMGT 161 **Building Materials and Construction Management I**	3.0
CMGT 162 **Building Materials and Construction Management II**	3.0
CMGT 163 **Building Materials and Construction Management III**	3.0
CMGT 261 **Construction Safety**	3.0
CMGT 262 **Building Codes**	3.0
CMGT 263 **Understanding Construction Drawings**	3.0
CMGT 264 **Construction Management of Field Operations**	3.0
CMGT 265 **Information Technology in Construction**	3.0
CMGT 266 **Building Systems I**	3.0
CMGT 267 **Building Systems II**	3.0
CMGT 361 **Contracts & Specifications I**	3.0
CMGT 362 **Contracts & Specifications II**	3.0
CMGT 363 **Estimating I**	3.0
CMGT 364 **Estimating II**	3.0
CMGT 365 **Soil Mechanics in Construction**	4.0
CMGT 371 **Structural Aspects in Construction I**	3.0
CMGT 372 **Structural Aspects in Construction II**	3.0
CMGT 366 **Construction Accounting and Financial Management**	3.0
CMGT 461 **Construction Management I**	3.0
CMGT 462 **Construction Management II**	3.0
CMGT 463 **Value Engineering I**	3.0
CMGT 465 **Marketing Construction Services**	3.0
CMGT 467 **Techniques of Project Control**	4.0
CMGT 468 **Real Estate Development**	3.0
CMGT 469 **Construction Seminar**	3.0

Professional electives*	12.0 Credits

Students select 12.0 credits from the following courses. Students may choose to take other professional electives but the permission of the Program Manager is required.

CMGT 380 **Special Topics: Project Management**	3.0

CMGT 380	**Special Topics: Construction Labor Relations**	3.0
CMGT 451	**Heavy Construction Principles and Practices**	3.0

Free electives	**15.0 Credits**

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Term 1		Credits
CHEM 101	General Chemistry I	3.5
CMGT 101	Introduction to Construction Management	3.0
CMGT 161	Building Materials & Construction Methods I	3.0
ENGL 101	Expository Writing and Reading	3.0
MATH 101	Introduction to Analysis I	4.0
	Term Credits	*16.5*

Term 2		Credits
CHEM 102	General Chemistry II	4.5
CMGT 161	Building Materials & Construction Methods I	3.0
ECON 201	Economics I	4.0
ENGL 102	Persuasive Writing and Reading	3.0
MATH 102	Introduction to Analysis II	4.0
	Humanities/Social Science elective	3.0
	Term Credits	*21.5*

Term 3		Credits
ACCT 115	Financial Accounting Foundations	4.0
CHEM 113	General Chemistry I Laboratory	1.5
CMGT 163	Building Materials & Construction Methods III	3.0
CMGT 263	Understanding Construction Drawings	3.0
ECON 202	Economics II	4.0
ENGL 103	Analytical Writing and Reading	3.0
	Term Credits	*18.5*

Term 4		Credits
CMGT 261	Construction Safety	3.0
CMGT 266	Building Systems I	3.0
CMGT 371	Structural Aspects in Construction I	3.0
FIN 301	Introduction to Finance	4.0
PHYS 182	Applied Physics I	3.0
	Term Credits	*16.0*

Term 5		Credits
CMGT 267	Building Systems II	3.0
CMGT 372	Structural Aspects in Construction II	3.0
CMGT 465	Marketing Construction Services	3.0
PHYS 183	Applied Physics II	3.0
STAT 201	Business Statistics I	4.0
	Term Credits	*16.0*

Term 6		Credits
BLAW 201	Business Law I	4.0
CMGT 361	Contracts And Specifications I	3.0
PHYS 184	Applied Physics III	3.0
STAT 202	Business Statistics II	4.0
	Term Credits	*14.0*

Term 7		Credits
CMGT 362	Contracts And Specifications II	3.0
CMGT 365	Soil Mechanics in Construction	4.0

		Credits
	Free elective	3.0
	Humanities/Social Science elective	3.0
	Term Credits	*13.0*

Term 8		Credits
CIVE 240	**Engineering Economic Analysis**	3.0
CIVE 251	**Engineering Surveying**	3.0
CMGT 262	**Building Codes**	3.0
	Humanities/Social Science elective	3.0
	Term Credits	*12.0*

Term 9		Credits
CMGT 468	**Real Estate**	3.0
CMGT 469	**Construction Seminar: Contemporary Issues**	3.0
	Free elective	3.0
	Humanities/Social Science elective	3.0
	Professional elective (See degree requirements for list)	3.0
	Term Credits	*15.0*

Term 10		Credits
CMGT 363	**Estimating I**	3.0
CMGT 366	**Construction Accounting and Financial Management**	3.0
CMGT 461	**Construction Management I**	3.0
	Free elective	3.0
	Humanities/Social Science elective	3.0
	Term Credits	*15.0*

Term 11		Credits
CMGT 364	**Estimating II**	3.0
CMGT 462	**Construction Management II**	3.0
CMGT 463	**Value Engineering I**	3.0
	Humanities/Social Science elective	3.0
	Term Credits	*12.0*

Term 12		Credits
CMGT 467	**Techniques of Project Control**	4.0
	Free elective	3.0
	Professional electives (See degree requirements for list)	6.0
	Term Credits	*13.0*

	Total Credits (minimum)	182.5

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Minor in Construction Management

Students in Civil Engineering, Architectural Engineering and Architecture may select to pursue Construction Management as a minor area of study. Because construction is inherently related to design in these disciplines, the Construction Management minor can be a natural extension of each field of study.

The requirements for the minor include:

- completion of a minimum of 24 credits
- courses used to fulfill general education requirements may not be counted toward an academic minor
- up to nine credits earned within the student's major may be counted toward the minor with minor department approval.
- prerequisite courses may be counted toward the minor if recommended by the minor department.

Required courses	Credits
CMGT 161 **Building Materials and Construction Management I**	3.0
CMGT 162 **Building Materials and Construction Management II**	3.0
CMGT 361 **Contracts & Specifications I**	3.0
CMGT 362 **Contracts & Specifications II**	3.0
CMGT 363 **Estimating I**	3.0
CMGT 467 **Techniques of Project Control**	3.0

Two of the following elective courses may be chosen to meet the minor requirements* :

	Credits
CMGT 261 **Construction Safety**	3.0
CMGT 263 **Understanding Construction Drawing**	3.0
CMGT 364 **Estimating II**	3.0
CMGT 461 **Construction Management I**	3.0
CMGT 462 **Construction Management II**	3.0
CMGT 463 **Value Engineering I**	3.0
CMGT 465 **Marketing Construction Services**	3.0

* Choice of electives must be approved by the department based on the student's major field and prior experience.

Certain courses within the student's major may also be used to meet the minor requirements. These include:

ARCH 261 **Environmental Systems I**		3.0
ARCH 262 **Environmental Systems II**		3.0
CIVE 240 **Engineering Economics**		3.0
ARCH 161 **Architectural Construction***		3.0

* ARCH 161 can be substituted for CMGT 161 for Architects. An elective may be substituted for CMGT 162.

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Certificate Program

The Construction Management Certificate Program was started at the request of two contractors' associations: the General Building Contractors Association and the Contractors Association of Eastern Pennsylvania. It is designed for people who have undergraduate degrees in other fields and are employed or wish to be employed in the construction industry. It is also used as a credential for people who are already working in the construction industry, but do not wish to pursue an undergraduate degree. The certificate program is a two-year program with the certificate awarded upon completion of 36 credits. Students interested in continuing their education after certification are able to apply their coursework and credits directly to the Bachelor of Science in Construction Management.

Courses*

CMGT 161	**Building Materials and Construction Management I**	3.0
CMGT 162	**Building Materials and Construction Management II**	3.0
CMGT 263	**Understanding Construction Drawing**	3.0
CMGT 264	**Construction Management of Field Operations**	3.0
CMGT 361	**Contracts & Specifications I**	3.0
CMGT 362	**Contracts & Specifications II**	3.0
CMGT 363	**Estimating I**	3.0
CMGT 461	**Construction Management I**	3.0
CMGT 462	**Construction Management II**	3.0
CMGT 463	**Value Engineering I**	3.0
CMGT 465	**Marketing Construction Services**	3.0
CMGT 467	**Techniques of Project Control**	3.0

*Course substitutions or other electives may be taken with prior approval from the Construction Management Program Manager.

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Communications and Applied Technology

Overview

The Bachelor of Science in Communications and Applied Technology is a multidisciplinary program designed for individuals who want to increase their knowledge of all aspects of business communications and relevant communication technologies, while understanding the business principles that are necessary to achieve corporate goals. The major offers a multidisciplinary approach combining theoretical and applied learning principles and encompasses the spectrum of internal and external communications that organizations utilize in their management and marketing functions. The program is tailored to meet the needs of people who sell, communicate, and manage in industries that are heavily customer oriented and are involved in or affected by world markets. The goal of the program is to increase students' understanding of communication, management, applicable technology, business, the world economy, and relationships within their corporate culture.

Program Goals:

• Combine communications and technology skills training with study of sound business fundamentals.

• Hone written, oral, and interpersonal communication skills for effectiveness in a variety of organizational settings, with both internal and external audiences.

• Expand written communication skills including research and design skills to produce reports, proposals, web sites, and other corporate documents.

• Provide conceptual understanding of various principles of management and organizational processes.

• Develop problem-solving, conflict-management, and decision-making skills

• Examine factors that explain international movement of persons, goods, services, financial capital, and technology across national boundaries.

• Understand legal and ethical issues in business communication, technological advancement, employer-employee relations, obligations to customers, and foreign populations.

Assessment of Prior Learning

The Goodwin College of Professional Studies will grant transfer credit for American Council on Education (ACE)-evaluated corporate training offered by professional associations such as the American Institute of Banking, the American College, and the College for Financial Planning as well as for industry certifications such as Microsoft Certified Professional. ACE-evaluated military training will be considered as well. In addition, credit by examination earned via College-Level Examination Program (CLEP), Defense Activity for Nontraditional Education Support (DANTES), Thomas Edison College Examination Program (TECEP), and Excelsior College Examinations (ECE) will also be assessed. All credits earned through assessment of prior learning are subject to advisor approval.

Curriculum

To complete the Bachelor of Science degree in Communications and Applied Technology, students must earn a minimum of 180 quarter credits comprising the following:

> English Composition
> Humanities
> Social Sciences
> Physical Sciences
> Mathematics
> Business
> Computing Technology
> Customer Operations

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Communications and Applied Technology

Bachelor of Science Degree: 180.0 credits

Required courses

English composition requirements		9.0 Credits
ENGL 101	**Expository Writing and Reading**	3.0
ENGL 102	**Persuasive Writing and Reading**	3.0
ENGL 103	**Analytical Writing and Reading**	3.0

Mathematics requirements		9.0 Credits
MATH 181	**Mathematical Analysis I**	3.0
MATH 182	**Mathematical Analysis II**	3.0
MATH 183	**Mathematical Analysis III**	3.0

Science requirements (Choose one sequence)		6.0 Credits
BIO 161	**General Biology I**	3.0
BIO 162	**General Biology II**	3.0
or		
CHEM 161	**General Chemistry I**	3.0
CHEM 162	**General Chemistry II**	3.0

Humanities Electives	12.0 Credits
Four humanities electives*	12.0

*Africana studies, communication, fine arts (history of architecture, art, film, music, theatre), foreign language, linguistics, literature, philosophy, women's studies, writing.

Social Science Electives*	18.0 Credits
Six social science electives	18.0

**Anthropology, economics, history, political science, psychology, sociology.

Free Electives	32.0 Credits

No more than 5 credits of free electives may be in business

Business requirements		40.0 Credits
ACCT 115	**Financial Accounting Foundations**	4.0
BLAW 201	**Business Law I**	4.0
ECON 201	**Economics I**	4.0
ECON 202	**Economics II**	4.0
FIN 301	**Introduction to Finance**	4.0
INTB 200	**International Business**	4.0
MKTG 301 WI	**Introduction to Marketing Management**	4.0
ORGB 300 WI	**Organizational Behavior**	4.0
OPM 300 WI	**Operations Management**	4.0
STAT 201	**Statistics I**	4.0

Communications and Applied Technology		54.0 Credits
CAT 200	**Strategies forLifelong Learning**	3.0
CAT 201	**Interpersonal Communication**	3.0
CAT 301	**Project Management**	3.0
CAT 302	**Customer Service Theory and Practice**	3.0
CAT 303	**Client Relations Management**	3.0
CAT 360	**Applied Organizational Research**	3.0
CAT 491	**Senior Project in CAT I**	3.0
CAT 492	**Senior Project in CAT II**	3.0
COM 230	**Techniques of Speaking**	3.0
COM 240	**New Technologies in Communication**	3.0
COM 270 WI	**Business Communication**	3.0
COM 370 WI	**Advanced Business Writing**	3.0
COM 335 WI	**Writing for the World Wide Web**	3.0
COM 340	**Desktop Publishing**	3.0
CT 230	**Web Development I: Introduction**	3.0
CT 240	**Web Development II: E-Commerce**	3.0
CT 385	**Web Development II: Database***	3.0
PHIL 323	**Organizational Ethics**	3.0

*After completion of CT 230, CT 240 and CT 385, students can sit for the Certified Internet Webmaster (CIW) exam.

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Computing and Security Technology

The Computing and Security Technology curriculum centers on the application of software and hardware technology to solve real-world problems. Attention is given to maintenance and administration of information systems, with courses covering each of the major components of computer infrastructure: hardware, servers, Linux, Windows, networks, web, security, databases and OO programming.

The Computing and Security Technology program is supported by eight state-of-the-art computer labs in the Goodwin College building and faculty are selected based on their academic credentials and industry experience.

Students have an opportunity to pursue two educational paths: a concentration in computing technology or a concentration in computing security. Each concentration consists of 96 credits, divided into 60 credits of core courses and 36 credits of required courses in the specific concentration.

For additional information about this major, visit the Goodwin College of Professional Studies web site.

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Computing and Security Technology

Bachelor of Science Degree: 185.0 credits

Students completing this major must select either a concentration in Computing Technology or a concentration in Computing Security.

Required courses

English requirements		12.0 Credits
COM 230	Techniques of Speaking	3.0
ENGL 101	Expository Writing and Reading	3.0
ENGL 102	Persuasive Writing and Reading	3.0
ENGL 103	Analytical Writing and Reading	3.0

Mathematics requirements		9.0 Credits
MATH 181	Mathematical Analysis I	3.0
MATH 182	Mathematical Analysis II	3.0
MATH 183	Mathematical Analysis III	3.0

Natural Science requirements		9.0 Credits
BIO 151	Applied Biology	3.0
CHEM 151	Applied Chemistry	3.0
PHYS 151	Applied Physics I	3.0

Liberal studies electives *	12.0 Credits

*Students must complete 12.0 credits in Liberal Studies covering a range of subject areas in the humanities and/or social sciences: anthropology, psychology, sociology, political science, history, philosophy, literature, economics, communication, music or art.

Free electives	47.0 Credits

Computing and Security Technology Core Requirements	60.0 Credits

CT 200	**Server I**	3.0
CT 320	**Server II**	3.0
CT 140	**Network Administration I**	3.0
CT 330	**Network Administration II**	3.0
CT 350	**Network Administration III**	3.0
CT 210	**Linux I**	3.0
CT 310	**Linux II**	3.0
CT 410	**Linux III**	3.0
CT 340	**Operating System Architecture I**	3.0
CT 360	**Operating System Architecture II**	3.0
CT 380	**Operating System Architecture III**	3.0
CT 230	**Web Development I**	3.0
CT 240	**Web Development II**	3.0
CT 385	**Web Development III**	3.0
CT 392	**Web Development IV**	3.0
CT 400	**Network Security I**	3.0
CT 395	**IT Security I**	3.0
CT 420	**IT Security II**	3.0
CT 491	**Senior Project I**	3.0
CT 496	**Senior Project II**	3.0

Computing Technology Concentration requirements		**36.0 Credits**
CT 100	**Microcomputer Hardware**	3.0
CT 120	**Microcomputer Operating System**	3.0
CT 220	**Database I**	3.0
CT 375	**Database II**	3.0
CT 425	**Database III**	3.0
CT 430	**Database IV**	3.0
CT 435	**Database V**	3.0
CT 370	**OO Systems Analysis**	3.0
CT 290	**OO Client Side Programming**	3.0
CT 390	**OO Server Side Programming**	3.0
CT 405	**OO Enterprise Programming**	3.0
CT 431	**Project Management**	3.0

Computing Technology electives

CT 438	**Database VI**	4.0
CT 388	**Special Topics in Computing Technology I**	4.0
CT 389	**Special Topics in Computing Technology II**	4.0

Computing Security Concentration requirements		**36.0 Credits**

CT 300	**Security Technology Models and Architecture**	3.0
CT 312	**Access Control & Intrusion Detection Technology**	3.0
CT 315	**Security Management Practice**	3.0
CT 325	**O/S Security Architecture I**	3.0
CT 336	**IP Security and VPN Technology**	3.0
CT 393	**IP Security Risk Assessment**	3.0
CT 402	**Network Security II**	3.0
CT 412	**IT Security Policies**	3.0
CT 415	**Disaster Recovery and ContinuityPlanning**	3.0
CT 422	**Incident Response Best Practices**	3.0
CT 432	**IT Security System Audits**	3.0
CT 472	**IT Security Defense Countermeasures**	3.0

Computing Security electives

CT 212	**Computer Forensics**	3.0
CT 213	**Forensic Data Recovery Technology**	3.0
CT 222	**Security and Information Warfare**	3.0
CT 225	**Data Mining Technology for Security**	3.0
CT 295	**Public Key Infrastructure Technology**	3.0
CT 326	**O/S Security Architecture II**	3.0
CT 355	**Wireless Network Security**	3.0
CT 362	**Network Auditing**	3.0
CT 382	**Applied Cryptography**	3.0
CT 407	**Network Security III**	3.0
CT 427	**e-Commerce and Web Security Technology**	3.0

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Post-Baccalaureate Certificate in Computing Security
24.0 credits

The Certificate in Computing Security is designed for computing technology professionals who have a B.S. degree in Computing Technology or considerable experience in the area, and who are seeking a career change or professional advancement with an additional focus on security.

The curriculum provides a deep understanding of the basic security-related issues and technologies as well as the flexibility to choose additional areas of study tailored to the needs of the individual student.

For additional information about this certificate programr, visit the Goodwin College of Professional Studies web site.

Required courses		18.0 Credits
CT 300	Security Technology Models and Architecture	3.0
CT 312	Access Control & Intrusion Detection Technology	3.0
CT 325	O/S Security Architecture I	3.0
CT 336	IP Security and VPN Technology	3.0
CT 402	Network Security II	3.0
CT 472	IT Security Defense Countermeasures	3.0

In addition, students select two of the following electives:		6.0 Credits

Computing Security electives		
CT 212	Computer Forensics	3.0
CT 222	Security and Information Warfare	3.0
CT 295	Public Key Infrastructure Technology	3.0
CT 315	Security Management Practice	3.0
CT 326	O/S Security Architecture II	3.0
CT 355	Wireless Network Security	3.0
CT 362	Network Auditing	3.0
CT 382	Applied Cryptography	3.0
CT 393	IP Security Risk Assessment	3.0
CT 412	IT Security Policies	3.0
CT 415	Disaster Recovery and Continuity Planning	3.0
CT 422	Incident Response Best Practices	3.0

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Culinary Arts

The culinary arts program prepares students for leadership positions in the fine foods segment of the hospitality industry. This baccalaureate degree in culinary arts is among the first of its kind in the United States. This program comprises approximately equal parts liberal arts, business and administration, hospitality management, and culinary arts. Students also receive a minor in business administration as well as completing the first year of foundation courses required for any accredited MBA degree. The incentive allows students to continue their education by taking advantage of many of the one-year MBA programs currently offered throughout the United States. In addition, the culinary arts program has take on an exciting new area of specialization: Culinology. The Research Chef's association defines Culinology as a merger between culinary arts and food science. It is now nationally recognized as a valued discipline and an emerging trend within the field of culinary education and the industry at large. Specific jobs for professionals with skills in the culinary arts and Culinology include food research and development professionals, corporate R & D chefs, applied food science specialists and chef educators.

For more information, visit the Culinary Arts and Hospitality Management Programs web site.

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Culinary Arts
Bachelor of Science Degree:

General education requirements		Credits
COM 280	**Public Relations**	3.0
ENGL 101	**Expository Writing and Reading**	3.0
ENGL 102	**Persuasive Writing and Reading**	3.0
ENGL 103	**Analytical Writing and Reading**	3.0
MATH 101	**Introduction to Analysis I**	4.0
MATH 102	**Introduction to Analysis II**	4.0
NFS 101	**Introduction to Nutrition and Foods**	3.0
HRM 210	**Safety and Sanitation**	4.0
UNIV 101	**The Drexel Experience**	2.0
	Arts and humanities electives	9.0
	Social science electives	6.0
	Free electives	12.0

Business minor courses		Credits
ACCT 115	**Financial Accounting Foundations**	4.0
ECON 201	**Economics I**	4.0
ECON 202	**Economics II**	4.0
FIN 301	**Introduction to Finance**	4.0
MKTG 301 WI	**Introduction to Marketing Management**	4.0
ORGB 300 WI	**Organizational Behavior**	4.0
OPM 300 WI	**Operations Management**	4.0
STAT 201	**Statistics I**	4.0

Departmental requirements		Credits
HRM 110	**Introduction to the Hospitality Industry**	3.0
HRM 115	**Culinary Science**	3.0
HRM 120	**Principles of Food-Service Management**	3.0
HRM 130	**Tourism I**	3.0
HRM 150	**Customer Service**	3.0
HRM 215	**Commercial Food Production**	3.0
HRM 200	**Productivity Software for the Hospitality Industry**	3.0

HRM 230	Design Application Seminar	3.0
HRM 310	Hospitality Accounting Systems	3.0
HRM 320	Hospitality Management Information Systems	3.0
HRM 330	Hospitality Marketing	3.0
HRM 335	Beverage Management	3.0
HRM 410	Laws of Hospitality Industry	3.0
HRM 455	Hospitality Human Resources	3.0

Culinary arts requirements		Credits
CULA 200	Professional Skills Laboratory I: Starch Workshop	1.5
CULA 205	Professional Skills Laboratory II: Butchery Workshop	1.5
CULA 210	Professional Skills Laboratory III: Baking Workshop	1.5
CULA 215	Foundations of Professional Baking	3.0
CULA 220	Patisserie I	2.0
CULA 225	Patisserie II	2.0
CULA 230	Major Techniques and Traditions	3.0
CULA 235	Professional Dining Room Management	1.5
CULA 300	Vegetarian Cuisine	3.0
CULA 305	The Italian Tradition	3.0
CULA 310	The French Tradition	3.0
CULA 315	The American Tradition	3.0
CULA 320	Advanced Culinary Studio	3.0
CULA 325	Garde Manger Lab	2.0
CULA 400	Directed Study With a Master Chef	2.0
CULA 405	Culture and Gastronomy I	3.0
CULA 410	Culture and Gastronomy II	3.0
CULA 415	Food Styling and Show Competition	2.0
CULA 420	Senior Design Project	3.0
CULA 216	A la Carte Cuisine	3.0

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BS Culinary Arts
4 YR UG Co-op Concentration

Term 1		Credits
ENGL 101	Expository Writing and Reading	3.0
HRM 110	Introduction to the Hospitality Industry	3.0
HRM 130	Tourism I	3.0
HRM 200	Software for Hospitality Industry	3.0
MATH 101	Introduction to Math Analysis I	4.0
UNIV 101	The Drexel Experience	1.0
	Term Credits	*17.0*

Term 2		Credits
ENGL 102	Persuasive Writing and Reading	3.0
HRM 150	Customer Service	3.0
HRM 210	Safety and Sanitation	3.0
MATH 102	Introduction to Math Analysis II	4.0
UNIV 101	The Drexel Experience	1.0
	Term Credits	*14.0*

Term 3		Credits
ENGL 103	Analytical Writing and Reading	3.0
HRM 120	Principles of Food-Service Management	3.0
HRM 410	Laws of Hospitality Industry	3.0
NFS 101	Introduction to Nutrition and Food	3.0
	Arts and Humanities elective	3.0
	Term Credits	*15.0*

Term 4		Credits
ACCT 115	Financial Accounting Foundations	4.0
ECON 201	Economics I	4.0
HRM 115	Culinary Science	3.0
HRM 220	Purchasing for the Hospitality Industry	3.0
HRM 230	Design Application Seminar	3.0
	Term Credits	*17.0*

Term 5		Credits
CULA 215	Foundations of Professional Baking	3.0
CULA 230	Major Techniques and Tradition	3.0
ECON 202	Economics II	4.0
HRM 215	Commercial Food Production	3.0
HRM 310	Hospitality Accounting Systems	3.0
	Term Credits	*16.0*

Term 6		Credits
CULA 205	Professional Skills Laboratory II	1.5
CULA 216	A la Carte Cuisine	3.0
CULA 220	Patisserie I	2.0
CULA 235	Professional Dining Room Management	1.5
CULA 315	The American Tradition	3.0
CULA 325	The Garde Manger Laboratory	2.0
	Term Credits	*13.0*

Term 7		Credits
CULA 200	Professional Skills Laboratory I	1.5

CULA 305	The Italian Tradition	3.0
STAT 201	Statistics I	4.0
	Arts and Humanities elective	3.0
	Culinary Arts (CULA) elective	3.0
	Term Credits	*14.5*

Term 8		Credits
CULA 225	Patisserie II	2.0
CULA 310	The French Tradition	3.0
CULA 405	Culture and Gastronomy I	3.0
FIN 301	Introduction to Finance	4.0
	Arts and Humanities elective	3.0
	Culinary Arts (CULA) elective	3.0
	Term Credits	*18.0*

Term 9		Credits
COM 280	Public Relations	3.0
CULA 210	Professional Skills Laboratory III	1.5
CULA 300	Vegetarian Cuisine	3.0
CULA 410	Culture and Gastronomy II	3.0
OPM 300	Operations Management	4.0
	Arts and Humanities elective	3.0
	Term Credits	*17.5*

Term 10		Credits
CULA 400	Directed Studies with a Master Chef	2.0
CULA 415	Food Styling and Show Competition	2.0
HRM 330	Hospitality Marketing	3.0
ORGB 300	Organizational Behavior	4.0
	Culinary Arts (CULA) elective	3.0
	Term Credits	*14.0*

Term 11		Credits
CULA 320	Advanced Culinary Studio	3.0
HRM 320	Hospitality Management Information Systems	3.0
HRM 335	Beverage Management	3.0
MKTG 301	Introduction to Marketing Management	4.0
	Term Credits	*13.0*

Term 12		Credits
CULA 420	Senior Design Project	3.0
HRM 455	Hospitality Human Resources Management	3.0
	Culinary Arts (CULA) elective	3.0
	Social science electives	6.0
	Term Credits	*15.0*

	Total Credits (minimum)	184.0

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Culinary Science

About Culinary Science
Culinary scientists learn to integrate and apply knowledge from the disciplines of chemistry, microbiology, culinary arts, hospitality, and nutrition in order to preserve, process, package, and distribute foods that are safe, nutritious, and delicious. Students majoring in Culinary Science are prepared for careers in the food industry such as a research chef or product developer. In such positions, graduates can combine their creative and aesthetic talents with their technical expertise as food scientists.

The Culinary Science program at Goodwin is committed to providing a professional, comprehensive, and challenging college experience as it prepares students for a variety of rewarding careers in the culinary field and food science and manufacturing industries. In order to provide students with a well-rounded educational experience, the Culinary Science curriculum is composed of approximately equal amounts of coursework in liberal arts, business administration, food science, natural sciences, and culinary arts. As part of the Culinary Science B.S. program, all students receive a minor in business that includes the first-year foundation courses required for an MBA degree at Drexel University.

Drexel's B.S. in Culinary Science curriculum meets the Approved Culinology® Degree Program standards of the Research Chefs Association. The 182-credit curriculum includes one six-month period of cooperative employment in the spring and summer terms of the junior year.

Career possibilities for someone with a degree in culinary science include numerous positions in food companies such as manager of research and development, quality assurance manager, corporate executive chef, research and development chef, senior culinary research technologist, flavor development laboratory manager, and senior formulation chef.

For more information, visit Goodwin College's Culinary Science web page.

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Culinary Science
Bachelor of Science Degree: 182.0 credits

Degree Requirements

Written Analysis and Communication		15.0 Credits
COM 230	Techniques of Speaking	3.0
COM 310	Technical Communication	3.0
ENGL 101	Expository Writing and Reading	3.0
ENGL 102	Persuasive Writing and Reading	3.0
ENGL 103	Analytical Writing and Reading	3.0

Mathematical Analysis		12.0 Credits
MATH 101	Introduction to Analysis I*	4.0
MATH 102	Introduction to Analysis II*	4.0
MATH 239	Math for the Life Sciences	4.0

*Students may substitute MATH 181, MATH 182, and MATH 183 with permission from an advisor.

Nutrition		12.0 Credits
NFS 200	Nutrition I	4.0
NFS 203	Nutrition II	4.0
NFS 365	Nutritional Laboratory	4.0

Humanities and Social Science		5.0 Credits
ANTH 101	Cultural Diversity	3.0
UNIV 101	The Drexel Experience	2.0

Biological Sciences		9.0 Credits
BIO 121	Physiology and Nutrition	4.5
BIO 122	Cells and Genetics	4.5

Chemistry		17.0 Credits
CHEM 101	General Chemistry I	3.5

CHEM 102	General Chemistry II	4.5
CHEM 103	General Chemistry III	5.0
NFS 400	Nutritional Chemistry	3.0
NFS 404	Nutritional Chemistry Laboratory	1.0

Physics		**8.0 Credits**
PHYS 103	General Physics I	4.0
PHYS 104	General Physics II	4.0

Business Administration Minor		**28.0 Credits**
ACCT 115	Financial Accounting Foundations	4.0
ECON 201	Economics I	4.0
ECON 202	Economics II	4.0
MKTG 301 WI	Introduction to Marketing Management	4.0
MKTG 347	New Product Development	4.0
ORGB 300 WI	Organizational Behavior	4.0
STAT 201	Statistics I	4.0

Food Science Requirements		**32.0 Credits**
FDSC 154	Foods: Composition, Interaction & Formulations	4.0
FDSC 270	Microbial Food Safety and Sanitation	4.0
FDSC 350	Experimental Foods	3.0
FDSC 450	Food Microbiology	3.0
FDSC 451	Food Microbiology Laboratory	2.0
FDSC 454	Microbiology and Chemistry of Food Safety	3.0
FDSC 456	Food Preservation Process	3.0
FDSC 458	Nutritional Impact of Food Processing	3.0
FDSC 460	Food Chemistry	3.0
FDSC 461	Food Analysis	3.0
FDSC 490	Food Science Seminar	1.0

Hospitality Management/Culinary Arts Requirements		**36.0 Credits**
HRM 110	Introduction to the Hospitality Industry	3.0
HRM 120	Principles of Food-Service Management	3.0
HRM 215	Commercial Food Production	3.0
CULA 230	Major Techniques and Traditions I	3.0
CULA 231	Major Techniques and Traditions II	3.0
CULA 399	Independent Study in the Culinary Arts: Practicum II	6.0
CULA 310	The French Tradition	3.0
CULA 315	The American Tradition	3.0
CULA 405	Culture and Gastronomy I	3.0

| CULA 410 | **Culture and Gastronomy II** | 3.0 |
| CULA 420 | **Senior Design Project** | 3.0 |

| **Hospitality Management/Culinary Arts Electives** | **9.0 Credits** |

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BS Culinary Science
4 YR UG Co-op Concentration

Term 1		Credits
CHEM 101	General Chemistry I	3.5
ENGL 101	Expository Writing and Reading	3.0
HRM 110	Introduction to the Hospitality Industry	3.0
MATH 101	Introduction to Analysis I	4.0
UNIV 101	The Drexel Experience	1.0
	Term Credits	*14.5*

Term 2		Credits
ANTH 101	Introduction to Cultural Diversity	3.0
CHEM 102	General Chemistry II	4.5
ENGL 102	Persuasive Writing and Reading	3.0
MATH 102	Introduction to Analysis II	4.0
UNIV 101	The Drexel Experience	1.0
	Term Credits	*15.5*

Term 3		Credits
CHEM 103	General Chemistry III	5.0
ENGL 103	Analytical Writing and Reading	3.0
FDSC 154	Foods: Composition, Interaction and Formulation	4.0
HRM 120	Principles of Food-Service Management	3.0
	Term Credits	*15.0*

Term 4		Credits
BIO 121	Physiology and Nutrition	4.5
CULA 230	Major Techniques and Tradition	3.0
NFS 200	Nutrition I: Principles of Nutrition	4.0
NFS 215	Nutritional Chemistry	3.0
NFS 404	Nutritional Chemistry Laboratory	1.0
	Term Credits	*15.5*

Term 5		Credits
BIO 122	Cells and Genetics	4.5
CULA 231	Major Techniques/Traditions II	3.0
FDSC 270	Microbial Food Safety and Sanitation	4.0
HRM 215	Commercial Food Production	3.0
	Term Credits	*14.5*

Term 6		Credits
ACCT 115	Financial Accounting Foundations	4.0
CULA 315	The American Tradition	3.0
ECON 201	Economics I	4.0
MATH 239	Mathematics for the Life Sciences	4.0
	Term Credits	*15.0*

Term 7		Credits
COM 230	Techniques of Speaking	3.0
CULA 291	Culinary Arts Practicum II	6.0
ECON 202	Economics II	4.0
	Culinary Arts (CULA) elective	3.0
	Term Credits	*16.0*

Term 8

		Credits
CULA 310	The French Tradition	3.0
FDSC 350	Experimental Foods: Product Development	3.0
FDSC 456	Food Preservation Processes	3.0
ORGB 300	Organizational Behavior	4.0
PHYS 103	General Physics I	4.0
	Term Credits	*17.0*

Term 9

		Credits
FDSC 454	Microbiology & Chemistry of Food Safety	3.0
FDSC 461	Food Analysis	3.0
NFS 203	Nutrition II: Nutrition in the Lifecycle	4.0
NFS 365	Nutrition Laboratory: Food and Nutrient Analysis	4.0
PHYS 104	General Physics II	4.0
	Term Credits	*18.0*

Term 10

		Credits
CULA 405	Culture and Gastronomy I	3.0
FDSC 450	Food Microbiology	3.0
FDSC 451	Food Microbiology Laboratory	2.0
MKTG 301	Introduction to Marketing Management	4.0
	Culinary Arts (CULA) elective	3.0
	Term Credits	*15.0*

Term 11

		Credits
CULA 410	Culture and Gastronomy II	3.0
FDSC 458	Nutritional Impact of Food Processing Methods	3.0
FDSC 460	Food Chemistry	3.0
MKTG 347	New Product Development	4.0
	Term Credits	*13.0*

Term 12

		Credits
COM 310	Technical Communication	3.0
CULA 420	Senior Design Project	3.0
FDSC 490	Seminar in Food Science	1.0
STAT 201	Business Statistics I	4.0
	Culinary Arts (CULA) elective	3.0
	Term Credits	*14.0*

	Credits
Total Credits (minimum)	**183.0**

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Minor in Food Science

The minor in food science is designed for students interested in applying the basic sciences to the world's largest industry. The minor should be especially attractive to students in the premedical, chemical, and biological sciences, as it provides a background for excellent employment and post-baccalaureate study opportunities in areas closely allied to their basic disciplines.

The minor consists of 25 credits. Interested students should consult with a nutrition and food science faculty member to schedule courses appropriate for their background and goals.

Required courses	Credits
NFS 200 WI **Nutrition I: Principles of Nutrition**	4.0
NFS 203 **Nutrition II: Nutrition in the Life Cycle**	4.0
NFS 270 **Microbial Food Safety and Sanitation**	4.0
NFS 454 **Microbiology and Chemistry of Food Safety**	3.0
NFS 458 **Nutritional Impact of Food Processing Methods**	3.0
NFS 460 WI **Food Chemistry**	3.0
NFS 461 **Food Chemistry Laboratory**	4.0

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General Studies

The General Studies program is designed for students who wish to gain a breadth of knowledge in the humanities, social sciences, and natural sciences. In addition, general studies students focus on a particular area of interest by following one of the concentrations that exist in the program:

Individualized Studies

This is a concentration designed for individuals with a diverse college background and varied educational interests that cannot be captured in a single degree program. In consultation with their academic advisor, students select a specialization within the concentration according to their interests. Students have the opportunity to experiment in a variety of academic subjects through a generous amount of free electives. An attractive feature is that students can complete certificate programs en route to their B.S. degree.

Liberal Studies

A concentration in Liberal Studies provides a broad-based liberal arts education that increases one's appreciation of the world at large and lays the necessary groundwork for graduate study. All liberal studies students take courses in communication, art or architecture history, literature, philosophy, history, political science, psychology, anthropology/sociology, and liberal studies electives. The final 36 credits in the course of study comprise the student's concentration requirements. Students choose to concentrate in either humanities or social sciences. The humanities concentration usually appeals to students interested in focusing on the fine arts, foreign language, literature, or writing. The social science concentration is excellent preparation for graduate school (including law school), research, and careers in which one would deal extensively with people.

Physical Sciences

A concentration in Physical Sciences can lead to graduate school, careers in research and, with the selection of natural science courses, medical , dental, pharmacy, and veterinary school. Students take courses in the following areas: calculus, biology, chemistry, and physics.

For more information on this major, visit Goodwin College's General Studies web page.

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Individualized Studies
Bachelor of Science Degree: 180.0 credits

Required courses

English requirements		12.0 Credits
ENGL 101	Expository Writing and Reading	3.0
ENGL 102	Persuasive Writing and Reading	3.0
ENGL 103	Analytical Writing and Reading	3.0
COM 230	Techniques of Speaking	3.0

Mathematics and Computers requirements		12.0 Credits
MATH 181	Mathematical Analysis I	3.0
MATH 182	Mathematical Analysis II	3.0
MATH 183	Mathematical Analysis III	3.0
CS 161	Introduction to Computing	3.0

Natural Science requirements		9.0 Credits
BIO 151	Applied Biology	3.0
CHEM 151	Applied Chemistry	3.0
PHYS 151	Applied Physics	3.0

Specialization Requirements	45.0 Credits
Students must complete 45.0 credits within an area of specialization.	

Liberal Studies requirements	36.0 Credits
Students must complete 36.0 credits in Liberal Studies, covering a range of subject areas in the humanities and/or social sciences: anthropology, psychology, sociology, political science, history, philosophy, literature and fine arts. (Arts history or appreciation courses, rather than applied courses.)	

Free electives	66.0 Credits

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Liberal Studies

Bachelor of Science Degree: 180.0 credits

Required courses

English requirements		9.0 Credits
ENGL 101	Expository Writing and Reading	3.0
ENGL 102	Persuasive Writing and Reading	3.0
ENGL 103	Analytical Writing and Reading	3.0

Mathematics and Computers requirements		12.0 Credits
MATH 181	Mathematical Analysis I	3.0
MATH 182	Mathematical Analysis II	3.0
CS 161	Introduction to Computing	3.0
	Statistics elective	3.0

Natural Science requirements		9.0 Credits
BIO 151	Applied Biology	3.0
CHEM 151	Applied Chemistry	3.0
PHYS 151	Applied Physics	3.0

Communication requirements		9.0 Credits
COM 210	Theory and Models of Communication	3.0
COM 230	Techniques of Speaking	3.0
	Communication elective	3.0

Women's or African-American Studies requirements		3.0 Credits

Music requirements		3.0 Credits
MUSC 130	Introduction to Music	3.0

Art History/Architecture requirements		9.0 Credits
ARTH 101	History of Art I: Ancient to Medieval	3.0
ARTH 102	History of Art II: Renaissance to Modern	3.0
ARTH 103	History of Art III: Early Modern to Postmodernism	3.0
or		
ARCH 141	Architecture and Society I	3.0
ARCH 142 WI	Architecture and Society II	3.0

[ARCH 143 WI](#) **Architecture and Society III**	3.0

Liberal Studies requirements	**69.0 Credits**

Students must complete 69.0 credits in Liberal Studies covering a range of subjects in the humanities and/or social sciences.

History	9.0
Literature	9.0
Philosophy	9.0
Political Science	9.0
Psychology	9.0
Anthropology or Sociology	9.0
Liberal Studies electives*	15.0

*(Subjects listed above, plus economics, women's and African-American studies, and music/art history.)

Concentration Requirements	**36.0 Credits**

Students must complete 36.0 credits within an area of concentration focusing on the humanities and/or social sciences. Courses must be upper level with at least 18.0 credits selected from one discipline. Social Science students are required to take SOC 250 and SOC 350: Research Methods I & II as part of their concentration.

Humanities/Social Science courses include anthropology, psychology, sociology, political science, history, philosophy, and literature.

Free electives	**21.0 Credits**

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Physical Sciences

Bachelor of Science Degree: 180.0 credits

Required courses

English requirements		9.0 Credits
ENGL 101	Expository Writing and Reading	3.0
ENGL 102	Persuasive Writing and Reading	3.0
ENGL 103	Analytical Writing and Reading	3.0

Mathematics and Computer Science requirements		19.0 Credits
CS 171	Computer Programming I	3.0
MATH 121	Calculus I	4.0
MATH 122	Calculus II	4.0
MATH 123	Calculus III	4.0
MATH 200	Multivariate Calculus	4.0

Communication requirements		6.0 Credits
COM 230	Techniques of Speaking	3.0
COM 310	Technical Communication	3.0

Philosophy requirements		6.0 Credits
PHIL 351	Philosophy of Technology	3.0
or		
PHIL 361	Philosophy of Science	
PHIL 251	Ethics	3.0
or		
BMES 338	Biomedical Ethics and Law	

Physical Science requirements		37.5 Credits
Biology		
BIO 161	General Biology I	3.0
BIO 162	General Biology II	3.0
BIO 163	General Biology III	3.0
Chemistry		
CHEM 161	General Chemistry I	3.0

CHEM 162	**General Chemistry II**	3.0
CHEM 163	**General Chemistry II**	3.0
CHEM 164	**General Chemistry Lab I**	2.0
CHEM 165	**General Chemistry Lab II**	2.5
Physics		
PHYS 185	**Physics I**	3.0
PHYS 186	**Physics I-A**	2.0
PHYS 187	**Physics II**	3.0
PHYS 188	**Physics II-A**	2.0
PHYS 281	**Physics III**	3.0
PHYS 282	**Physics III-A**	2.0

Physical Science electives	**27.0 Credits**

Students must complete 27.0 credits of natural science electives. Courses must be upper level in biology, chemistry, and/or physics.

Liberal Studies electives	**27.0 Credits**

Students must complete 27.0 credits covering a range of subjects in the humanities and/or social sciences: anthropology. economics, fine arts, history, literature, philosophy, political science, psychology, sociology, etc.

Free electives	**48.5 Credits**

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Hospitality Management

The Hospitality Management program at Drexel University, Goodwin College recognizes the critical importance of an interdisciplinary education with a global perspective for tomorrow's leaders and managers. Committed to building student knowledge across functional areas and contributing disciplines, the program allows for increased specialization with concentrations in one of four areas:

- Food & Beverage Management
- Gaming and Resort Management
- Travel and Tourism
- Hotel Management Administration

According to The Gourman Report, which provides rankings of undergraduate programs in American and international universities, Drexel University's Hospitality Management program was ranked in the top tenth percentile of national programs.

For more information, visit the Culinary Arts and Hospitality Management Programs web site.

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Hospitality Management
Bachelor of Science Degree

General education requirements		Credits
COM 230	Techniques of Speaking	3.0
COM 280	Public Relations	3.0
ENGL 101	Expository Writing and Reading	3.0
ENGL 102	Persuasive Writing and Reading	3.0
ENGL 103	Analytical Writing and Reading	3.0
MATH 101	Introduction to Analysis I	4.0
MATH 102	Introduction to Analysis II	4.0
NFS 101	Introduction to Nutrition and Foods	3.0
UNIV 101	The Drexel Experience	2.0
	Foreign language courses or arts and humanities electives	12.0
	Social science electives	6.0
	Free electives	12.0

Business minor courses		
ACCT 115	Financial Accounting Foundations	4.0
ECON 201	Economics I	4.0
ECON 202	Economics II	4.0
FIN 301	Introduction to Finance	4.0
MKTG 301 WI	Introduction to Marketing Management	4.0
ORGB 300 WI	Organizational Behavior	4.0
OPM 300 WI	Operations Management	4.0
STAT 201	Statistics I	4.0

Departmental requirements		
HRM 110	Introduction to the Hospitality Industry	3.0
HRM 115	Culinary Science	3.0
HRM 120	Principles of Food-Service Management	3.0
HRM 130	Tourism I	3.0
HRM 135	Tourism II	3.0
HRM 150	Customer Service	3.0
HRM 200	Productivity Software for the Hospitality Industry	3.0

HRM 210	Safety and Sanitation	3.0
HRM 215	Commercial Food Production	3.0
HRM 230	Design Application Seminar	3.0
HRM 310	Hospitality Accounting Systems	3.0
HRM 320	Hospitality Management Information Systems	3.0
HRM 325	Hotels Rooms Division Management	3.0
HRM 330	Hospitality Marketing	3.0
HRM 335	Beverage Management	3.0
HRM 410	Laws of Hospitality Industry	3.0
HRM 455	Hospitality Human Resources	3.0
	Concentration courses	21.0-22.0
	Departmental electives	15.0

Concentrations

Food and Beverage Management (F&B)

Courses		16.5 Credits
HRM 220	Purchasing for the Hospitality Industry	3.0
HRM 250	Contract Food-Service Management	3.0
HRM 315	Continental, Ethnic, and Regional Cuisine	3.0
HRM 340	Catering Management	3.0
HRM 435	Wine and Spirits	3.0
CULA 235	Professional Dining Room Management	1.5

Hotel Management Administration

Courses		16.5 Credits
HRM 326	Hotel Rooms Division Management II	3.0
HRM 345	Convention and Trade Shows Management	3.0
HRM 355	Resort Management	3.0
HRM 425	Hospitality Industry Administration	3.0
HRM 430	Hotel Sales and Marketing	3.0
CULA 235	Professional Dining Room Management	1.5

Travel and Tourism

Courses		15.0 Credits
HRM 345	Convention and Trade Shows Management	3.0
HRM 365	Heritage Tourism	3.0
HRM 385	Guest Lecture Series	3.0
HRM 395	Economics of Tourism	3.0
HRM 405	Current Issues in Travel and Tourism	3.0

Gaming and Resort Management

Courses		21.0 Credits
HRM 355	**Resort Management**	3.0
HRM 370	**Gaming and Casino Management I**	3.0
HRM 371	**Gaming and Casino Management II**	3.0
HRM 375	**Security and Loss Prevention**	3.0
HRM 470	**Gaming Legislation, Policy and Law**	3.0
HRM 472	**Gaming Information Systems**	3.0
HRM 475	**Current Issues in Gaming**	3.0

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BS Hospitality Management
4 YR UG Co-op Concentration

Term 1		Credits
ENGL 101	Expository Writing and Reading	3.0
HRM 110	Introduction to the Hospitality	3.0
HRM 130	Tourism I	3.0
HRM 200	Productivity Software for the Hospitality Industry	3.0
MATH 101	Introduction to Math Analysis I	4.0
UNIV 101	The Drexel Experience	1.0
	Term Credits	*17.0*

Term 2		Credits
ENGL 102	Persuasive Writing and Reading	3.0
HRM 150	Customer Service	3.0
HRM 210	Safety and Sanitation	3.0
MATH 102	Introduction to Math Analysis II	4.0
UNIV 101	The Drexel Experience	1.0
	Term Credits	*14.0*

Term 3		Credits
ENGL 103	Analytical Writing and Reading	3.0
HRM 115	Culinary Science	3.0
HRM 120	Principles of Food-Service Management	3.0
HRM 135	Tourism II	3.0
HRM 410	Laws of Hospitality Industry	3.0
NFS 101	Introduction to Nutrition and Food	3.0
	Term Credits	*18.0*

Term 4		Credits
ACCT 115	Financial Accounting Foundations	4.0
ECON 201	Economics I	4.0
HRM 215	Commercial Food Production	3.0
HRM 230	Design Application Seminar	3.0
	Term Credits	*14.0*

Term 5		Credits
ECON 202	Economics II	4.0
HRM 310	Hospitality Accounting Systems	3.0
HRM 325	Hotel Room Division Management	3.0
	Free elective	3.0
	HRMT concentration course (See degree requirements for list)	3.0
	Term Credits	*16.0*

Term 6		Credits
STAT 201	Statistics I	4.0
	Arts and Humanities elective	3.0
	HRMT concentration course (See degree requirements for list)	3.0
	Hospitality Management program elective	3.0
	Term Credits	*13.0*

Term 7		Credits
	Arts and Humanities elective	3.0
	HRMT concentration course (See degree requirements for list)	3.0
	Hospitality Management program elective	3.0

	Social science elective	3.0
	Term Credits	*12.0*

Term 8		**Credits**
COM 230	Techniques of Speaking	3.0
FIN 301	Introduction to Finance	5.0
	HRMT concentration course (See degree requirements for list)	3.0
	Hospitality Management program elective	3.0
	Term Credits	*14.0*

Term 9		**Credits**
COM 280	Public Relations	3.0
OPM 300	Operations Management	4.0
	Arts and Humanities elective	3.0
	Free elective	3.0
	HRMT concentration course (See degree requirements for list)	3.0
	Hospitality Management program elective	3.0
	Term Credits	*19.0*

Term 10		**Credits**
HRM 330	Hospitality Marketing	3.0
ORGB 300	Organizational Behavior	4.0
	Arts and Humanities elective	3.0
	Free elective	3.0
	HRMT concentration course (See degree requirements for list)	3.0
	Term Credits	*16.0*

Term 11		**Credits**
HRM 320	Hospitality Management Information Systems	3.0
HRM 335	Beverage Management	3.0
MKTG 301	Introduction to Marketing Management	4.0
	HRMT concentration course (See degree requirements for list)	3.0
	Term Credits	*13.0*

Term 12		**Credits**
HRM 455	Hospitality Human Resources Management	3.0
	Free elective	3.0
	HRMT concentration course (See degree requirements for list)	3.0
	Hospitality Management program elective	3.0
	Social science elective	3.0
	Term Credits	*15.0*

	Total Credits (minimum)	**181.0**

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Industrial Engineering Technology

The current demand for industrial engineers is high, but the supply of credentialed industrial engineers is limited. The trend toward an automated workplace and demands for greater efficiency in business and industry further enhance employment prospects for industrial engineers.

Coursework

The coursework for the Bachelor of Science in Industrial Engineering Technology provides a solid understanding of materials, design, statistics, operations research, information systems, methods engineering, manufacturing engineering, cost accounting, and production economy. Emphasis is placed on basic engineering and applied science, with the remainder of the program devoted to the humanities and those aspects of management pertinent to organizing and managing systems to produce and distribute services and products.Through the selection of electives, the curriculum offers options for specialization in a number of areas, providing the student with a sound basis for graduate study in management and industrial engineering.

Core courses include chemistry, calculus, physics, computer programming, principles of economics, technical writing, and coursework in various engineering principles. In the final year, students complete three levels of project design in a team setting.

For more information on this major, visit Goodwin College's Industrial Engineering Technology web page.

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Industrial Engineering Technology

Bachelor of Science Degree: 186.0 credits

Required courses

English composition requirements		15.0 Credits
ENGL 101	Expository Writing and Reading	3.0
ENGL 102	Persuasive Writing and Reading	3.0
ENGL 103	Analytical Writing and Reading	3.0
COM 310	Technical Communication	3.0
COM 230	Principles of Communication	3.0

Mathematics requirements		21.0 Credits
MATH 121	Calculus I	4.0
MATH 122	Calculus II	4.0
MATH 123	Calculus III	4.0
MATH 261	Linear Algebra	3.0
STAT 261	Statistics I	3.0
STAT 262	Statistics II	3.0

Science requirements		20.0 Credits
CHEM 161	General Chemistry I	3.0
CHEM 164	Chemistry Laboratory	2.0
PHYS 185	Physics I	3.0
PHYS 186	Physics I-A	2.0
PHYS 187	Physics II	3.0
PHYS 188	Physics II-A	2.0
PHYS 281	Physics III	3.0
PHYS 282	Physics III-A	2.0

Business requirements		12.0 Credits
ACCT 115	Financial Accounting Foundations	4.0
FIN 301	Introduction to Finance	4.0
MKTG 301 WI	Introduction to Marketing Management	4.0

Humanities and Social Science requirements		17.0 Credits
ECON 201	Economics I	4.0
ECON 202	Economics II	4.0
HIST 285	Technology in Historical Perspective	3.0
PHIL 315	Engineering Ethics	3.0
	Two Humanities and Social Sciences electives*	6.0

* HIST 285 Technology in Historical Perspective is a recommended Humanities and Social Sciences elective.

Engineering sciences requirements		17.0 Credits
CIVE 240	Engineering Economics	3.0
CT 100	Microcomputer Hardware	3.0
CT 290	Client Side Programmnig	3.0
MET 100	Graphical Communication	4.0
MET 101	Manufacturing Materials	4.0

Industrial Engineering Core requirements		49.0 Credits
INDE 300	Quality Management	3.0
INDE 350	Industrial Engineering Simulation	3.0
INDE 351	Intelligent Manufacturing Systems	3.0
INDE 361	Quality Control	3.0
INDE 362	Operations Research for Engineering I	3.0
INDE 363	Operations Research for Engineering II	3.0
INDE 365	Systems Analysis Methods I	3.0
INDE 366	Systems Analysis Methods II	3.0
INDE 367	Data Processing	3.0
INDE 370	Industrial Project Management	3.0
INDE 470	Engineering Quality Methods	3.0
INDE 490	Senior Project Design	4.0
OPM 300 WI	Operations Management	4.0
OPM 341	Supply Chain Management	4.0
OPM 325	Advanced Planning and Control of Operations	4.0

Professional (Technical) electives	21.0 Credits

Free electives	14.0 Credits

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Recommended Plan Of Study

BS Industrial Engineering Technology

Term 1		Credits
CHEM 161	General Chemistry I	3.0
CHEM 164	General Chemistry Laboratory I	2.0
ENGL 101	Expository Writing and Reading	3.0
MATH 121	Calculus I	4.0
	Term Credits	*12.0*

Term 2		Credits
CT 100	Microcomputer Hardware	3.0
ENGL 102	Persuasive Writing and Reading	3.0
MATH 122	Calculus II	4.0
PHYS 185	Physics I	3.0
PHYS 186	Physics I-A	2.0
	Term Credits	*15.0*

Term 3		Credits
ENGL 103	Analytical Writing and Reading	3.0
MATH 123	Calculus III	4.0
MET 101	Manufacturing Materials	4.0
PHYS 187	Physics II	3.0
PHYS 188	Physics II-A	2.0
	Term Credits	*16.0*

Term 4		Credits
COM 111	Principles of Communication	3.0
MATH 261	Linear Algebra	3.0
MET 100	Graphical Communication	4.0
PHYS 281	Physics III	3.0
PHYS 282	Physics III-A	2.0
	Term Credits	*15.0*

Term 5		Credits
ACCT 115	Financial Accounting Foundations	4.0
HIST 285	Technology in Historical Perspective	3.0
INDE 362	Operations Research for Engineering I	3.0
STAT 261	Statistics I	3.0
	Humanities/Social Science elective	3.0
	Term Credits	*16.0*

Term 6		Credits
FIN 301	Introduction to Finance	4.0
INDE 363	Operations Research for Engineering II	3.0
INDE 365	Systems Analysis Methods I	3.0
STAT 262	Statistics II	3.0
	Free electives	6.0
	Term Credits	*19.0*

Term 7		Credits
CT 290	Client Side Programming	3.0
INDE 361	Quality Control	3.0
OPM 300	Operations Management	4.0
	Free elective	3.0
	Term Credits	*13.0*

Term 8 — Credits

Course	Title	Credits
ECON 201	Economics I	4.0
INDE 350	Industrial Engineering Simulation	3.0
INDE 366	Systems Analysis Methods II	3.0
INDE 370	Industrial Project Management	3.0
OPM 325	Control Production & Operations	4.0
	Technical elective	3.0
	Term Credits	*20.0*

Term 9 — Credits

Course	Title	Credits
COM 230	Techniques of Speaking	3.0
ECON 202	Economics II	4.0
INDE 351	Intelligent Manufacturing Systems	4.0
PHIL 315	Engineering Ethics	3.0
	Technical elective	3.0
	Term Credits	*17.0*

Term 10 — Credits

Course	Title	Credits
CIVE 240	Engineering Economic Analysis	3.0
INDE 300	Quality Management	3.0
MKTG 301	Introduction to Marketing Management	4.0
	Technical electives	6.0
	Term Credits	*16.0*

Term 11 — Credits

Course	Title	Credits
INDE 367	Data Processing	3.0
INDE 470	Engineering Quality Methods	3.0
POM 341	Advanced Operations Planning & Control	3.0
	Free elective	3.0
	Technical elective	3.0
	Term Credits	*15.0*

Term 12 — Credits

Course	Title	Credits
INDE 490	Senior Project Design	4.0
	Free elective	3.0
	Technical electives	6.0
	Term Credits	*13.0*

Total Credits (minimum) — **187.0**

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Professional Studies

About the Major
The B.S. in Professional Studies is designed for aspiring professionals in any industry. Students are encouraged to take the technical knowledge they already possess in their fields, and learn to utilize it as creative and innovative leaders and communicators.

The core coursework emphasizes computing, researching, planning, problem-solving, decision-making, and leading people. In addition to courses in social sciences, business and communications, students become acquainted with creativity theory and practice, learning to apply creativity principles to enhance their individual, team,and organization.

Career Opportunities
The program helps students from a variety of industries improve their professional skills and strengthen their position in the job market. Industries with employees that may benefit from the Professional Studies include, but are not limited to:

- Telecommunications
- Aerospace
- Pharmaceutical
- Retail

Opportunities for Professional Studies graduates include:

- Career advancement within students' current organizations and industries
- Preparation to pursue a master's degree in a variety of areas

Transfer Credits
To maximize prior coursework and previous learning, students are provided with a personal evaluation of credits they have earned at other institutions as well as other certifications they may have received. Credit for prior learning can be earned through:

- Transfer agreements with other colleges and universities
- The College Level Examination Program (CLEP)
- Portfolio assessments

Program Delivery Options
The Professional Studies degree-completion program offers several flexible delivery options. This major is delivered in a variety of formats so that part-time

students can complete their degree in the delivery format that best fits their lifestyle.

- *Saturday Scholars option*: Students who already possess an associate's degree or equivalent credits may complete their degree entirely on Saturdays through the Goodwin College's Saturday Scholars program, providing virtually no interruption to their weekday routine.
- *Evening option*: Students can complete their degree by participating in the Goodwin College's venerable evening program. Courses meet one night per week for three or four hours.
- *Hybrid option*: Students who desire maximum flexibility may schedule a blend of Saturday, evening, and online classes.

For more information about this major, visit [Goodwin College's Professional Studies](#) web page.

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Professional Studies
Bachelor of Science Degree: 180.0 credits

Required courses

English composition requirements		9.0 Credits
ENGL 101	Expository Writing and Reading	3.0
ENGL 102	Persuasive Writing and Reading	3.0
ENGL 103	Analytical Writing and Reading	3.0

Communication requirements		12.0 Credits
COM 111	Principles of Communication	3.0
COM 230	Techniques of Speaking	3.0
COM 270 WI	Business Communication	3.0
COM 345	Intercultural Communication	3.0

Mathematics requirements		9.0 Credits
MATH 181	Mathematical Analysis I	3.0
MATH 182	Mathematical Analysis II	3.0
MATH 183	Mathematical Analysis III	3.0

Science requirements		9.0 Credits

Science Sequence Options (Choose one sequence)

BIO 161	General Biology I	3.0
BIO 162	General Biology II	3.0
or		
CHEM 161	General Chemistry I	3.0
CHEM 162	General Chemistry II	3.0
or		
PHYS 182	Applied Physics I	3.0
PHYS 183	Applied Physics II	3.0

Science elective

	Students select one science elective	3.0

Adult Transition Seminar — **3.0 Credits**

CAT 200	Strategies for Lifelong Learning	3.0

Social and Behavioral Science requirements — **21.0 Credits**

ANTH 101	Cultural Diversity: Introduction to Cultural Anthropology	3.0
PHIL 105	Critical Reasoning	3.0
PHIL 323	Organizational Ethics	3.0
PSY 101	General Psychology I	3.0
SOC 101	Introduction to Sociology	3.0
SOC 340	Globalization	3.0
SOC 210	Race and Ethnic Relations	3.0
or		
SOC 230	Women and Men in Changing Society	3.0

Business requirements — **24.0 Credits**

BLAW 201	Business Law I	4.0
BUSN 301	Accounting and Finance for Non-Financial Professionals	4.0
HRMT 323	Principles of Human Resource Administration	4.0
MGMT 260	Introduction to Entrepreneurship	4.0
MKTG 301 WI	Introduction to Marketing Management	4.0
ORGB 300 WI	Organizational Behavior	4.0

Creativity Studies — **9.0 Credits**

CRTV 301	Foundations in Creativity	3.0
CRTV 302	Tools and Techniques in Creativity	3.0
CRTV 303	Creativity in the Workplace	3.0

Professional Studies Core — **30.0 Credits**

CAT 301	Project Management	3.0
CAT 302	Customer Service Theory and Practice	3.0
CAT 360	Applied Organizational Research	3.0
PRST 211	Computer Applications for Professionals	3.0
PRST 212	Creative Studies in the WWW	3.0
PRST 330	Career and Professional Development	3.0
PRST 440	Policy Analysis	3.0
PRST 450	Creative Leadership for Professionals	3.0
PRST 491 WI	Professional Portfolio I	3.0

PRST 492 WI Professional Portfolio II	3.0

Free Electives*	**54.0 Credits**

*Depending on transfer credits and professional goals, students may use free electives to pursue a minor such as Business or to pursue a certificate program. Students should see their academic advisor for details.

Writing-Intensive Course Requirements
In order to graduate, all students beginning with the entering class of 2002/01 (fall, 2002) must pass three writing-intensive courses after their freshman year. Two writing-intensive courses must be in a student's major. The third can be in any discipline. Students are advised to take one writing-intensive class each year, beginning with the sophomore year, and to avoid "clustering" these courses near the end of their matriculation. Transfer students need to meet with an academic advisor to review the number of writing-intensive courses required to graduate.

A "WI" next to a course in this catalog indicates that this course can fulfill a writing-intensive requirement. Departments will designate specific sections of such courses as writing-intensive. Sections of writing-intensive courses are not indicated in this catalog. Students should check the section comments in Banner when registering. Students scheduling their courses in Banner can also conduct a search for courses with the attribute "WI" to bring up a list of all writing-intensive courses available that term. For more information on writing-intensive courses, see the Drexel University Writing Program's Writing-Intensive Course page.

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Professional Studies

Bachelor of Science Degree: 180.0 credits

Part-time/Evening Program
Recommended Plan of Study:

First year

(Fall)		Credits
CAT 200	**Strategies for Lifelong Learning**	3.0
ENGL 101	**Expository Writing and Reading**	3.0
MATH 181	**Mathematical Analysis I**	3.0
	Total credits	9.0

(Winter)		
COM 111	**Principles of Communication**	3.0
ENGL 102	**Persuasive Writing and Reading**	3.0
MATH 182	**Mathematical Analysis II**	3.0
	Total credits	9.0

(Spring)		
ENGL 103	**Techniques of Analysis Evaluation**	3.0
MATH 183	**Mathematical Analysis III**	3.0
SOC 101	**Introduction to Sociology**	3.0
	Total credits	9.0

(Summer)		
ANTH 101	**Cultural Diversity: Introduction to Cultural Anthropology**	3.0
COM 270	**Business Communication**	3.0
	Total credits	6.0

Second year

(Fall)		
CRTV 301	**Foundations in Creativity**	3.0
	Science sequence I *	3.0
	Free elective	3.0
	Total credits	9.0

*[BIO 161](#) or [CHEM 161](#) or [PHYS 182](#).

(Winter)

[CRTV 302](#)	**Tools and Techniques in Creativity**	3.0
[PHIL 105](#)	**Critical Reasoning**	3.0
	Science sequence II*	3.0
	Total credits	9.0

*[BIO 162](#) or [CHEM 162](#) or [PHYS 183](#).

(Spring)

[COM 230](#)	**Techniques of Speaking**	3.0
[CRTV 303](#)	**Creativity in the Workplace**	3.0
	Science elective	3.0
	Total credits	9.0

(Summer)

[MKTG 301 WI](#)	**Introduction to Marketing Management**	4.0
	Free elective	3.0
	Total credits	7.0

Third year

(Fall)

[BUSN 301](#)	**Accounting and Finance for Non-Financial Professionals**	4.0
[PRST 211](#)	**Computer Applications for Professionals**	3.0
	Free elective	3.0
	Total credits	10.0

(Winter)

[ORGB 300 WI](#)	**Organizational Behavior**	4.0
[PRST 212](#)	**Creative Studies in the WWW**	3.0
[PSY 101](#)	**General Psychology I**	3.0
	Total credits	10.0

(Spring)

[BLAW 201](#)	**Business Law I**	4.0
[HRMT 323](#)	**Principles of Human Resource Administration**	4.0
	Total credits	8.0

(Summer)

[CAT 302](#)	**Customer Service Theory and Practice**	3.0
	Free elective	3.0
	Total credits	6.0

Fourth year

(Fall)

[MGMT 260](#)	**Introduction to Entrepreneurship**	4.0

COM 345	Intercultural Communication	3.0
	Free elective	3.0
	Total credits	10.0

(Winter)

SOC 210 or	Race and Ethnic Relations	3.0
SOC 230	Women and Men in Changing Society	3.0
	Free elective	3.0
	Total credits	6.0

(Spring)

CAT 301	Project Management	3.0
	Free elective	3.0
	Total credits	6.0

(Summer)

	Free electives	6.0
	Total credits	6.0

Fifth year

(Fall)

SOC 340	Globalization	3.0
	Free electives	6.0
	Total credits	9.0

(Winter)

PHIL 323	Organizational Ethics	3.0
PRST 330	Career and Professional Development	3.0
	Free elective	3.0
	Total credits	9.0

(Spring)

PRST 440	Policy Analysis	3.0
	Free electives	6.0
	Total credits	9.0

(Summer)

	Free electives	6.0
	Total credits	6.0

Sixth year

(Fall)

CAT 360	Applied Organizational Research	3.0
PRST 450	Creative Leadership for Professionals	3.0
	Total credits	6.0

(Winter)

PRST 491 WI	**Professional Portfolio I**	3.0
	Free elective	3.0
	Total credits	6.0

(Spring)

PRST 492 WI	**Professional Portfolio II**	3.0
	Free elective	3.0
	Total credits	6.0

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Sport Management

Through Drexel's Sport Management program, students master the knowledge and skills necessary for success in the fields of Sport Management, athletics/coaching, sports psychology and other professions supporting sports and recreation.

The program focuses on the integration of applicable areas of learning including athletics management, business, business administration, communication and technology. It uses a multidisciplinary approach (athletics and human performance; sport and the psycho-socio-cultural process; sports as an industry) to understand sports and manage the sports industry. Students will also develop the important supporting skills in technology. The major emphasizes the practical application of skills to the solution of problems in the management of sports, athletics and recreation on the professional, amateur and community level.

Coursework

The B. S. in Sport Management consists of 181 credits. All students enrolled in the program are required to take 47 credits of general education courses plus 49 credits of core courses on the foundations of Sport Management. These courses are supplemented by 27 credits of free electives.The balance of the program is based on technical elective courses drawn from four major concentrations, namely Athletics, Health & Human Performance (15 credits);The Business of Sport (15 credits); Sport & the Psycho-Socio-Cultural Process (15 credits);Technology for Sport Management (13 credits).

Degree Completion Options

The Bachelor of Science degree in sport management can be completed in either four or five years:

Five-year option, with co-op experience

This option allows for the greatest amount of employment experience, with three distinct six-month periods of employment included with studies. After the start of the sophomore year, students study or work through all terms, including summers.

Four-year option, with internship experience

This option includes just one six-month period of full-time employment. After the start of the sophomore year, students study or work through all terms, including summers.

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Sport Management
Bachelor of Science Degree: 181.0 credits

General education requirements		**47.0 Credits**
BIO 151	**Applied Biology I**	3.0
CHEM 151	**Applied Chemistry**	3.0
COM 230	**Techniques of Speaking**	3.0
COM 270	**Writing for Business**	3.0
CS 161	**Introduction to Computing**	3.0
or		
INFO 101	**Introduction to Information Technology**	3.0
ENGL 101	**Expository Writing and Reading**	3.0
ENGL 102	**Persuasive Writing and Reading**	3.0
ENGL 103	**Analytical Writing and Reading**	3.0
MATH 101	**Introduction to Analysis I**	4.0
MATH 102	**Introduction to Analysis II**	4.0
PHYS 151	**Applied Physics**	3.0
PSCI 100	**Introduction to Political Science**	4.0
UNIV 101	**The Drexel Experience**	2.0

Select one of the following three English courses:

ENGL 200 WI	**Classical to Medieval Literature**	3.0
ENGL 201	**Renaissance to the Enlightenment**	3.0
ENGL 202 WI	**Romanticism to Modernism**	3.0

Select one of the following two English courses:

ENGL 203 WI	**Post-Colonial Literature I: Africa/Asia/Caribbean/Japan/Middle East**	3.0
ENGL 204	**Post-Colonial Literature II: Africa/Asia/Caribbean/Japan/Middle East**	3.0

Core courses		**52.0 Credits**
BUSN 101	**Foundations of Business I**	4.0
ACCT 115	**Financial Accounting Foundations**	4.0
COM 290	**Sports and the Mass Media**	3.0
ORGB 300 WI	**Organizational Behavior**	4.0

HRMT 323	**Principles of Human Resource Administration**	4.0
SMT 110	**Business of Sport**	3.0
SMT 152	**Leadership in Sport and Society**	3.0
SMT 200	**Introduction to Facility and Event Management**	3.0
SMT 201	**Sports Marketing, Promotion and Public Relations**	3.0
SMT 230	**Sport and the Law**	3.0
SMT 250	**Technology and Sport**	3.0
SMT 300	**Quantitative Analysis /Statistics for Sports**	3.0
SMT 320	**Economic Aspects of Sport Management**	3.0
PHIL 325	**Ethics in Sport Management**	3.0
PSY 245	**Sports Psychology**	3.0
SOC 268	**Sociology of Sport**	3.0

Athletics, Health and Human Performance   **15.0 Credits**

Select 15.0 credits from the following courses:

ANAT 101	**Anatomy & Physiology I**	5.0
BCS 352	**Life-Span Human Development***	3.0
NFS 101	**Introduction to Nutrition and Foods**	3.0
NFS 310	**Nutrition and Sports**	3.0
PSY 310	**Drugs and Human Behavior**	3.0
SMT 280	**Kinesiology**	3.0
SMT 101	**Principles of Coaching**	3.0
SMT 120	**Life Skills for Coaches**	3.0
SMT 210	**Prevention/Care for Athletic Injuries**	3.0
SMT 390	**Special Topics in Sport Management**	3.0

* Course offered through the College of Nursing and Health Professions

The Business of Sport   **15.0 Credits**

BLAW 201	**Business Law I**	4.0
ECON 201	**Economics I**	4.0

In addition to BLAW 201 and ECON 201, students select from following electives to complete a minimum of 15.0 credits in this area:

ACCT 116	**Managerial Accounting Foundations**	4.0
BLAW 202	**Business Law II**	4.0
ECON 202	**Economics II**	4.0
MKTG 301	**Introduction to Marketing Management**	4.0
SMT 220	**Recreation, Wellness and Society**	3.0
SMT 235	**Sports Administration and Governance**	3.0
SMT 340	**International Aspects of Sport Management**	3.0
SMT 365	**Operations Management in Sports**	3.0
SMT 475	**Coaching Practicum**	3.0

Sport and the Psycho/Socio-cultural Process | **15.0 Credits**

Select five of the following courses:

PHIL 210	Philosophy of Sport	3.0
PSY 101	General Psychology I	3.0
PSY 120	Developmental Psychology	3.0
PSY 140	Approaches to Personality	3.0
PSY 212	Physiological Psychology	3.0
PSY 230	Psychology of Learning	3.0
PSY 342	Counseling Psychology	3.0
PSY 355	Health Psychology	3.0
SMT 330	Gender Equity and Women in Sport	3.0
SMT 335	Minority Issues and Opportunities in Sport	3.0
SOC 101	Introduction to Sociology	3.0
SOC 210	Race and Ethnic Relations	3.0
SOC 250	Research Methods I	3.0

Technology for Sport Management	**13.0 Credits**

COM 240	New Technologies in Communication	3.0
COM 335	Writing for the World Wide Web	3.0
MIS 300	Management of Information Systems	4.0
	Technology elective**	3.0

**Suggested Technology electives include: COM 300 On-line Journalism, COM 340 Desktop Publishing, INFO 102 Intro to Information Systems, INFO 105 Information Evaluation, Organization and Use, DIGM 150 Overview of Digital Media, FMVD 110 Shooting and Lighting, MIS 341 Micro-computing Technology for Business. Check with the Sport Management program for additional technical elective options.

Electives	**26.0 Credits**
Free electives***	26.0

*** Students may pursue a minor or take further studies in the sport management area electives.

Writing-Intensive Course Requirements
In order to graduate, all students beginning with the entering class of 2002/01 (fall, 2002) must pass three writing-intensive courses after their freshman year. Two writing-intensive courses must be in a student's major. The third can be in any discipline. Students are advised to take one writing-intensive class each year, beginning with the sophomore year, and to avoid "clustering" these courses near the end of their matriculation. Transfer students need to meet with an academic advisor to review the number of writing-intensive courses required to graduate.

A "WI" next to a course in this catalog indicates that this course can fulfill a writing-intensive requirement. Departments will designate specific sections of such courses as writing-intensive. Sections of writing-intensive courses are not indicated in this catalog. Students should check the section comments in Banner when registering. Students scheduling their courses in Banner can also conduct a search for courses with the attribute "WI" to bring up a list of all writing-intensive courses available that term.

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Recommended Plan Of Study

BS Sport Managment
5 YR UG Co-op Concentration

Term 1		Credits
BUSN 101	Foundations of Business I	4.0
ENGL 101	Expository Writing and Reading	3.0
MATH 101	Introduction to Math Analysis I	4.0
SMT 110	Business of Sports	3.0
SOC 101	Introduction to Sociology	3.0
UNIV 101	The Drexel Experience	1.0
	Term Credits	*18.0*

Term 2		Credits
BIO 151	Applied Biology	3.0
ENGL 102	Persuasive Writing and Reading	3.0
MATH 102	Introduction to Math Analysis II	4.0
PSY 101	General Psychology I	3.0
SMT 200	Facility and Event Management	3.0
UNIV 101	The Drexel Experience	1.0
	Term Credits	*17.0*

Term 3		Credits
ACCT 115	Financial Accounting Foundations	4.0
CHEM 151	Applied Chemistry	3.0
ENGL 103	Analytical Writing and Reading	3.0
CS 161	Introduction to Computing	3.0
or		
INFO 101	Introduction to Information Technology	3.0
	Athletics/Health/Performance course (See degree requirement)	3.0
	Term Credits	*16.0*

Term 4		Credits
BLAW 201	Business Law I	4.0
COM 270	Business Communication	3.0
COM 290	Sports and the Mass Media	3.0
PHYS 151	Applied Physics	3.0
SMT 250	Technology and Sport	3.0
	Term Credits	*16.0*

Term 5		Credits
COM 230	Techniques of Speaking	3.0
ECON 201	Economics I	4.0
PSY 245	Sports Psychology	3.0
SMT 201	Sports Marketing, Promotion, and Public Relations	3.0
	Athletics/Health/Performance course (See degree requirement)	3.0
	Term Credits	*16.0*

Term 6		Credits
COM 240	New Technologies in Communication	3.0
SMT 152	Leadership in Sport and Society	3.0
SOC 268	Sociology of Sport	3.0
	Business of Sport course (See degree requirements for list)	3.0
	Free elective	3.0
	Term Credits	*15.0*

Term 7

		Credits
ORGB 300	Organizational Behavior	4.0
PSCI 100	Introduction to Political Science	4.0
	Athletics/Health/Performance course (See degree requirement)	3.0
	Sport & Pscyho/Sociocultural course (See degree requirments)	3.0
	Term Credits	**14.0**

Term 8

		Credits
HRMT 323	Principles of Human Resource Administration	4.0
ENGL 203 or	Post-Colonial Literature I	3.0
ENGL 204	Post-Colonial Literature II	3.0
	Business of Sport course (See degree requirements for list)	3.0
	Free elective	3.0
	Sport & Pscyho/Sociocultural course (See degree requirments)	3.0
	Term Credits	**16.0**

Term 9

		Credits
MIS 300	Management Information Systems	4.0
ENGL 200 or	Classical to Medieval Literature	3.0
ENGL 201 or	Renaissance to the Enlightenment	3.0
ENGL 202	Romanticism to Modernism	3.0
	Business of Sport course (See degree requirements for list)	3.0
	Free elective	4.0
	Term Credits	**14.0**

Term 10

		Credits
PHIL 325	Ethics in Sports Management	3.0
SMT 300	Quantitative Analysis and Statistics in Sport	3.0
	Business of Sport course (See degree requirements for list)	3.0
	Free elective	3.0
	Technology elective (See degree requirements)	3.0
	Term Credits	**15.0**

Term 11

		Credits
COM 335	Writing for the World Wide Web	3.0
SMT 230	Sport and the Law	3.0
	Athletics/Health/Performance course (See degree requirement)	3.0
	Free elective	3.0
	Term Credits	**12.0**

Term 12

		Credits
SMT 320	Economic Aspects of Sports Management	3.0
	Free electives	6.0
	Sport & Pscyho/Sociocultural course (See degree requirments)	3.0
	Term Credits	**12.0**

	Total Credits (minimum)	181.0

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Sport Management

The Master of Science in Sport Management prepares its graduates for positions in sport management at all levels (recreational, youth, inter-scholastic, amateur, collegiate, professional) and within several organizational settings (public, private, non-profit, corporations).

The program content provides an integrated educational experience directed toward developing the ability to apply knowledge and skills to the planning, design, implementation, and evaluation of sport programs and offer solutions to practical problems in the sport management field. Graduates are expected to be leaders in their chosen area of interest by incorporating the various perspectives from the multidisciplinary training and applying them to current issues in sport and society.

Program Goals
Graduates of the Master of Science in Sport Management will be able to:

- Apply the fundamentals of business to sport management.
- Integrate the principles of management; organizing people and resources to get results in the field of sport.
- Apply the area of law and labor relations to the sports industry and agency.
- Use existing technologies and be prepared for emerging technologies in the sport management field.
- Forecast new developments and adapt to the rapidly changing sports environment.
- Creatively direct the economic contributions that sports and recreation offer to people, organizations, and the community.
- Effectively organize, evaluate and improve and use new information in sports.
- Utilize the knowledge and skills learned to produce an in-depth research project or thesis, which will serve to advance the study of sport management.

For additional information, view the Goodwin College of Professional Studies' Sport Management program web page.

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Master of Science in Sport Management
45 post-baccalaureate credits

Curriculum

Core Foundation Courses		21.0 Credits
SMT 601	**Sports Industry Management**	3.0
SMT 602	**Sport Law**	3.0
SMT 603	**Sports Marketing and Public Relations**	3.0
SMT 604	**Sport Media and Technology**	3.0
SMT 605	**Economic Issues in Sport**	3.0
SMT 606	**Contemporary Issues in Sport**	3.0
SMT 610	**Seminar on Sports Research**	3.0

Elective/Concentration Courses		15.0 Credits
Students select any five of the following courses:		
SMT 620	**Technology and the Sports Product**	3.0
SMT 621	**Leadership in Sport Management**	3.0
SMT 622	**Sports Agents and Labor Relations**	3.0
SMT 623	**Sports Facility Management**	3.0
SMT 624	**Sports Science for Sport Managers**	3.0
SMT 625	**Sport Promotions and Sales**	3.0
SMT 626	**Globalization of Sport**	3.0
SMT 627	**Sports Tournaments and Events**	3.0
SMT 628	**Coaching and Managing**	3.0
SMT 630	**Sports Industry Practicum**	3.0

Project/ Research Thesis		9.0 Credits
SMT 698	**Research Design and Techniques in Sport**	3.0
SMT 699	**Project/Research Thesis**	6.0

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Master of Science in Food Science

The M.S. in Food Science program provides a science-based professional education that encompasses classroom theory, practical research, and application. Food science is concerned with foods, their ingredients, and their physicochemical and biochemical interactions at the molecular and cellular levels.

Graduate students in the food science program participate in the research enterprise by completing a research project or designing and executing a thesis under faculty direction. Current research in food science includes:

- Physicochemical changes during deep-fat frying
- Development of a biosensor for antioxidant capacity
- Development of reduced fat and reduced sodium products
- Microbial safety of Mexican-style cheeses
- Microbial loads on foods in supermarkets

Opportunities

The M.S. in Food Science is designed for students who:

- are already working within the food industry and seeking professional advancement.
- have an undergraduate degree in a general science-related area such as biology or chemistry, and would like to change fields or move into the more specialized field of food science

The M.S. in Food Science offers students numerous opportunities for hands-on, real-world careers in applied science and technology. Potential employers include food product manufacturers, along with other companies providing services related to institutional feeding or supplying ingredients, processing equipment, and packaging materials. Technical and administrative positions are also available in various government agencies and with independent testing laboratories.

Food scientists are needed in the areas of:

- Food quality assessment and management
- Food processing and engineering
- Food product research and development
- Marketing and distribution
- Technical sales and support

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Master of Science in Food Science
45 post-baccalaureate credits

Required courses		Credits
BIO 641	Data Analysis in the Biosciences	3.0
BIO 610	Biochemistry II	2.0
NFS 531	Micronutrient Metabolism	3.0
NFS 601	Research Methods in Applied Nutrition	3.0
NFS 865	Seminar in Nutrition and Food Sciences	2.0
NFS 554	Microbiology and Chemistry of Food Safety	3.0
NFS 558	Nutritional Impact of Food-Processing Methods	3.0
NFS 560	Advanced Food Chemistry	3.0
NFS 561	Food Analysis	3.0
NFS 669	Readings in Food Science	3.0
NFS 650	Food Microbiology	3.0
NFS 651	Food Microbiology Laboratory	2.0
ENVR 636	Principles of Toxicology I	3.0
	Electives*	8.0

*Electives are selected from departmental or related course offerings (excluding NFS 506) in consultation with the student's graduate advisor. Possibilities include courses in various aspects of nutrition; special topics in food science such as taste and odor and organoleptic evaluation; microbial physiology; microbial genetics; recombinant DNA techniques; chemical instrumentation; biochemistry; sanitary microbiology; toxicology; and environmental sciences. Students electing the thesis option may include up to six credits of NFS 997 (Research in Nutrition and Food Sciences) among their electives.

Research
Students are invited to participate in research by designing and completing a research project or thesis. All thesis students consult with a faculty advisor and prepare a research proposal. Students present their proposals to their thesis committee for approval and, at the prerogative of the faculty, complete the research and report on it in seminar presentations. Students may elect to work in ongoing research or in some cases may suggest a new research area of specific interest to them. Individual guidance is necessary before research can commence, and there is periodic review during the course of the work. Students must submit a final written thesis to their thesis committee and defend the thesis at a final oral examination. Students in the thesis option may include up to six credits of NFS 997, Research in Nutrition and Food Sciences, among their electives.

Students selecting the non-thesis option are required to pass a written comprehensive examination. Students in the non-thesis option may include up to three credits of NFS 997, Research in Nutrition and Food Sciences, among their electives.