TELECOMMUNICATIONS, MS

Banner Code: VS-MS-TCOM

Academic Advising

MSN 2B5
4400 University Drive
Fairfax, VA 22030

Phone: 703-993-3810
Email: tcom@gmu.edu
Website: telecom.gmu.edu

The innovative, interdisciplinary MS in Telecommunications Program provides a blend of cutting-edge engineering-oriented courses in wireless and fiber communications systems, networks, computers, and Internet protocols, combined with courses on telecommunications policy, legal, business, and international aspects. The interdisciplinary program is designed for students who wish to enter the field of telecommunications or are working in the field and want to advance their knowledge of telecommunications. It concentrates on practical applications of telecommunications rather than a theoretical approach. It focuses on the engineering and IT aspects of telecommunications, in combination with the interdisciplinary knowledge offered by selected courses in telecommunications business and policy. More than 30 new engineering and IT courses have been designed especially for this program, including four certificate programs that may be incorporated into, and taken concurrently with, the MS in telecommunications.

Program Structure

A novelty of the program is its structure, which consists of four emphasis areas. This structure allows students to identify more clearly the various specialties in telecommunications technology. Students enjoy considerable flexibility because they are able to design their master’s programs to fit their technical preferences, including the option of taking courses in other programs at Mason. A majority of the course material comes from the Electrical and Computer Engineering (ECE) Department and the Systems Engineering and Operations Research (SEOR) Department. Courses offered by ECE focus on network technologies, such as fiber optics, and Internet protocols; network applications, such as networked multicomputer systems, client-server architectures, and network management; and wireless communications, such as digital communications, satellite communications, mobile communications, and GPS. Unique courses in the telecommunications program, such as Border Gateway Protocols, Interior Gateway Protocols, MPLS, GPS, and Advanced Link Design, complement courses given in ECE programs. In addition to the many new telecommunications courses developed for this program, ECE already offers a number of other graduate courses in communications as part of the graduate electrical engineering and computer engineering programs. Those courses may also be taken for credit under the MS in Telecommunications Program, provided students have the prerequisite background. Courses related to systems engineering, project management, and business of telecommunications (including the design and optimization of large, complex communication networks) are offered by SEOR. Both SEOR fields, systems engineering and operations research, play significant roles in all aspects of the design, operation, and business of telecommunications, and this knowledge is important for students of telecommunications. The blend of in-depth knowledge of specific elements of telecommunications technology, combined with knowledge of broader issues in telecommunications, is increasingly necessary for people who intend to work in a management or decision-making position within the telecommunications industry, telecommunications-related businesses, or government institutions dealing with telecommunications. The MS in telecommunications provides that blend.

Admissions & Policies

Admissions

Requirements

Specific application deadlines and requirements (https://admissions.gmu.edu/grad/application-deadlines-and-requirements/?academicUnit=VS&ga=1.107632321.273102085.1480697294) are available through the Office of Graduate Admissions.

The program is open to students who hold a BS or BA degree from an accredited college or university in engineering, math, science, computer science, business (with a quantitative background), economics, or other analytical disciplines, and students who have equivalent work experience indicating analytical aptitude. Depending on their background, some applicants may be required to complete 3 to 6 credits of preliminary course work before they are allowed to enroll in any of the core courses or emphasis courses in the program. Applicants who have not studied mathematics beyond the equivalent of algebra II/trigonometry at high school or introductory calculus classes (such as those offered in business or database management programs) will be required to take TCOM 530 Data Communications Fundamentals, the foundation course that prepares students for TCOM 521 Systems Engineering for Telecommunications Management, prior to being allowed to take TCOM 500 Modern Telecommunications. A minimum undergraduate GPA of 3.00 is usually required.

Students may be admitted to the MS program as degree seeking students, or they may be admitted for nondegree study within the program, which allows them to take individual courses. Students in the nondegree program may apply to the degree program, provided their GPA within the MS in Telecommunications Program is 3.00 or above. Up to 12 credits earned in nondegree study may be transferred into the degree program, provided each of the courses to be transferred in was passed with a grade of B or above.

Policies

Program Format

The program consists of 9 credits of mandatory engineering and technology core courses (TCOM 500 Modern Telecommunications, TCOM 530 Data Communications Fundamentals and TCOM 521 Systems Engineering for Telecommunications Management); 6 credits of electives drawn from an interdisciplinary group of core courses (PUBP 726 Telecommunications Policy, TCOM 547 Project Management in Telecommunications, or TCOM 750 Coordinating Seminar), and a basic switching lecture and laboratory course (TCOM 514 Basic Switching: Lecture and Laboratory Course) or an Internet protocol routing lecture and laboratory course (TCOM 515 Internet Protocol Routing: Lecture and Laboratory Course); and four areas of emphasis. Students who enter the program with an undergraduate degree that shows evidence of successfully completing LAN and WAN technologies may substitute TCOM 535 The TCP/
IP Suite of Internet Protocols for TCOM 530 Data Communications Fundamentals in their mandatory core program, respectively.

Students must complete 30 credits of coursework through a combination of core and emphasis courses. The core consists of 15 credits, with the remaining 15 credits earned in areas of emphasis. The emphases are sub-areas of telecommunications that provide necessary depth.

Students are usually expected to take courses from at least two emphasis areas. Up to 6 credits from the core program may be carried forward into the emphases, thus permitting up to 6 credits of electives to be taken inside or outside the prime area chosen by the student. TCOM 530 Data Communications Fundamentals may be carried forward into emphasis area 1, 2, or 3; TCOM 521 Systems Engineering for Telecommunications Management may be carried forward into emphasis area 4. Double counting is not permitted, but the courses carried forward into a given emphasis may permit that area's credit requirement to be satisfied, thus allowing elective courses to be taken outside that area. Usually, a minimum of 6 credits is needed to satisfy one emphasis area.

**Program Requirements**

Students must complete a minimum of 30 graduate credits with a GPA of 3.00 or higher. Students must earn a B (3.00) or above in core courses TCOM 500 Modern Telecommunications, TCOM 521 Systems Engineering for Telecommunications Management and TCOM 530 Data Communications Fundamentals. Up to 6 credits of a combination of C grades may be carried within the program from the remaining core courses or from the emphasis courses, provided the overall GPA is 3.00 or higher.

**Telecommunications Certificates**

Three 15-credit certificates are offered by the MS in TCOM Program. Students may pursue these certificates as stand-alone programs or as part of their degree program. For the former, they are required to submit a graduate program application indicating their desire to enroll in the appropriate graduate certificate program. For the latter, because they are already enrolled in a degree program, they need only add the appropriate graduate certificate to their graduate program status at least one semester prior to the award of the certificate. The courses within the certificates are drawn directly from the MS in TCOM Program. If a student initially signs up for only a certificate program, it is possible to transfer into the degree program later, transferring up to 12 credits into the degree program. Students must therefore ensure they have transferred into the degree program prior to starting coursework to ensure that all credits from the certificate program may transfer into the degree program. Students who transfer from a certificate program into the degree program may earn the certificate and the degree on satisfactory completion of the respective requirements. Applicable courses may count for the certificate and the degree programs.

Students may transfer in one 3-credit course from another program or institution toward their TCOM certificate, provided the course in question was passed with a B grade or higher. Students are permitted to carry one C grade within their certificate program, provided the overall GPA is 3.00 or above.

- Advanced Networking Protocols for Telecommunications Graduate Certificate
- Telecommunications Forensics and Security Graduate Certificate
- Wireless Communications Graduate Certificate

**Requirements**

**Degree Requirements**

Total credits: 30

<table>
<thead>
<tr>
<th>Plan of Study</th>
<th>Credits</th>
</tr>
</thead>
</table>

**Required Courses**  
TCOM 500 Modern Telecommunications 3  
TCOM 521 Systems Engineering for Telecommunications Management 3  
TCOM 530 Data Communications Fundamentals or TCOM 535 The TCP/IP Suite of Internet Protocols 3

**Elective Core Courses**  
Select 6 credits from the following: 6

<table>
<thead>
<tr>
<th>Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>PUBP 726 Telecommunications Policy</td>
<td></td>
</tr>
<tr>
<td>TCOM 514 Basic Switching: Lecture and Laboratory Course or TCOM 515 Internet Protocol Routing: Lecture and Laboratory Course</td>
<td>2</td>
</tr>
<tr>
<td>TCOM 547 Project Management in Telecommunications</td>
<td></td>
</tr>
<tr>
<td>TCOM 750 Coordinating Seminar</td>
<td>3</td>
</tr>
</tbody>
</table>

**Area of Emphasis**  
15

1 Students must receive prior permission to substitute TCOM 535 The TCP/IP Suite of Internet Protocols for TCOM 530 Data Communications Fundamentals.

2 Both TCOM 514 Basic Switching: Lecture and Laboratory Course and TCOM 515 Internet Protocol Routing: Lecture and Laboratory Course may be taken for credit, but only one may be used to satisfy a core elective requirement.

3 See below for list of courses that fulfill each area of emphasis.

**Areas of Emphasis**

A minimum of 15 credits is required. Students usually take 15 credits from at least two of the four emphasis areas, or they may elect to take all 15 credits from the systems engineering of telecommunications area (emphasis 4). Students electing to carry forward a core course (TCOM 530 Data Communications Fundamentals or TCOM 521 Systems Engineering for Telecommunications Management) into an appropriate emphasis area have the option of taking an elective course in that area or an alternate area to bring the total number of credits in the emphasis area to 15.

An area of emphasis can be completed by courses listed under the emphasis or considered applicable to that area for a total of at least 6 credits. Some emphasis courses are in more than one area; for example, TCOM 535 The TCP/IP Suite of Internet Protocols is in emphasis 1, network technologies, and emphasis 2, network applications.

Basic courses in each emphasis have been specially designed for the telecommunications program. These courses do not require completion of prerequisites from other MS programs in the Volgenau School. Other courses, which are marked with asterisks, are from other MS programs in the Volgenau School and represent viable options for students who
have appropriate prerequisites in some technical areas. Although these courses assume certain prerequisites from their specific MS programs, advanced students who already know the prerequisite material can seek instructor permission to enroll in those courses.

Alternatives to completing each emphasis area by using appropriate combinations of courses not listed under a given module may be admissible subject to prior approval by the program director. In addition, independent study, reading, and research courses may be taken in all five areas. These courses permit students to make use of their work experiences to undertake non-classroom courses for credit within the program.

Mason has negotiated an articulation agreement with the University of Virginia that allows up to 12 credits of the Informational Systems Management Certificate Program from the University of Virginia to be transferred into emphasis area 4 of the TCOM Program. In addition, graduate students from the National Defense University (NDU) may transfer up to 9 credits from NDU's Information Security Certificate Program.

Courses listed below from other graduate programs in the Volgenau School listed can be taken for credit in this program if the student has the appropriate prerequisites. Other courses from other programs may be taken for credit, with prior approval.

### Emphasis 1, Network Technologies

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>TCOM 515</td>
<td>Internet Protocol Routing: Lecture and Laboratory Course</td>
<td>3</td>
</tr>
<tr>
<td>TCOM 535</td>
<td>The TCP/IP Suite of Internet Protocols</td>
<td>3</td>
</tr>
<tr>
<td>TCOM 551</td>
<td>Digital Communication Systems</td>
<td>3</td>
</tr>
<tr>
<td>TCOM 561</td>
<td>Security, Privacy, and Applied Cryptography for Telecommunications</td>
<td>3</td>
</tr>
<tr>
<td>TCOM 562</td>
<td>Network Security Fundamentals</td>
<td>3</td>
</tr>
<tr>
<td>TCOM 608</td>
<td>Optical Communications Systems</td>
<td>3</td>
</tr>
<tr>
<td>TCOM 609</td>
<td>Interior Gateway Protocol (IGP) Routing</td>
<td>3</td>
</tr>
<tr>
<td>TCOM 610</td>
<td>Border Gateway Protocol (BGP) Routing</td>
<td>3</td>
</tr>
<tr>
<td>TCOM 631</td>
<td>Voice Over IP</td>
<td>3</td>
</tr>
<tr>
<td>TCOM 660</td>
<td>Network Forensics</td>
<td>3</td>
</tr>
<tr>
<td>TCOM 661</td>
<td>Digital Media Forensics</td>
<td>3</td>
</tr>
<tr>
<td>TCOM 663</td>
<td>Operations of Intrusion Detection for Forensics</td>
<td>3</td>
</tr>
<tr>
<td>TCOM 664</td>
<td>Incident Response Forensics</td>
<td>3</td>
</tr>
<tr>
<td>ECE 542</td>
<td>Computer Network Architectures and Protocols</td>
<td>3</td>
</tr>
<tr>
<td>ECE 565</td>
<td>Introduction to Optical Electronics</td>
<td>3</td>
</tr>
<tr>
<td>ECE 642</td>
<td>Design and Analysis of Computer Communication Networks</td>
<td>3</td>
</tr>
<tr>
<td>ECE 643</td>
<td>Network Switching and Routing</td>
<td>3</td>
</tr>
<tr>
<td>CS 571</td>
<td>Operating Systems</td>
<td>3</td>
</tr>
<tr>
<td>CS 756</td>
<td>Performance Analysis of Computer Networks</td>
<td>3</td>
</tr>
</tbody>
</table>

### Emphasis 2, Network Applications

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>TCOM 515</td>
<td>Internet Protocol Routing: Lecture and Laboratory Course</td>
<td>3</td>
</tr>
<tr>
<td>TCOM 535</td>
<td>The TCP/IP Suite of Internet Protocols</td>
<td>3</td>
</tr>
</tbody>
</table>

### Emphasis 3, Wireless Communications

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>TCOM 551</td>
<td>Digital Communication Systems</td>
<td>3</td>
</tr>
<tr>
<td>TCOM 552</td>
<td>Introduction to Mobile Communications Systems</td>
<td>3</td>
</tr>
<tr>
<td>TCOM 562</td>
<td>Network Security Fundamentals</td>
<td>3</td>
</tr>
<tr>
<td>TCOM 606</td>
<td>Advanced Mobile Communications Systems</td>
<td>3</td>
</tr>
<tr>
<td>TCOM 607</td>
<td>Satellite Communications</td>
<td>3</td>
</tr>
<tr>
<td>TCOM 653</td>
<td>Global Positioning System (GPS)</td>
<td>3</td>
</tr>
<tr>
<td>TCOM 660</td>
<td>Network Forensics</td>
<td>3</td>
</tr>
<tr>
<td>TCOM 707</td>
<td>Advanced Link Design</td>
<td>3</td>
</tr>
<tr>
<td>ECE 732</td>
<td>Mobile Communication Systems</td>
<td>3</td>
</tr>
<tr>
<td>ECE 741</td>
<td>Wireless Networks</td>
<td>3</td>
</tr>
</tbody>
</table>

### Emphasis 4, Systems Engineering of Telecommunications

This area of emphasis can be taken as one of two emphases or as one 15-credit emphasis. No more than two SYST courses can be taken within this area.

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>TCOM 547</td>
<td>Project Management in Telecommunications</td>
<td>3</td>
</tr>
<tr>
<td>TCOM 561</td>
<td>Security, Privacy, and Applied Cryptography for Telecommunications</td>
<td>3</td>
</tr>
<tr>
<td>SYST 510</td>
<td>Systems Definition and Cost Modeling</td>
<td>3</td>
</tr>
<tr>
<td>SYST 513</td>
<td>Total Systems Engineering, Reengineering and Enterprise Integration</td>
<td>3</td>
</tr>
<tr>
<td>SYST 542</td>
<td>Decision Support Systems Engineering</td>
<td>3</td>
</tr>
<tr>
<td>INFS 612</td>
<td>Principles and Practices of Communication Networks</td>
<td>3</td>
</tr>
</tbody>
</table>
Accelerated Master’s

Electrical Engineering, BS/Telecommunications, Accelerated MS

Overview
Highly-qualified students in the Electrical Engineering, BS have the option of obtaining an accelerated Telecommunications, MS.

For more detailed information, see AP.6.7 Bachelor’s/Accelerated Master’s Degrees. For policies governing all graduate degrees, see AP.6 Graduate Policies.

Admission Requirements
Students can apply for the program during the semester in which they expect to complete 90 undergraduate credits applicable toward the BS degree. An overall GPA of at least 3.10 at the time of application is required. Criteria for admission are identical to criteria for admission to the MS in Telecommunications Program. Application is made using the accelerated graduate program application forms, and all usual requirements must be met. The accelerated program application form specifies the overlapping courses and details the 3.10 undergraduate GPA.

Accelerated Option Requirements
Students must complete 145 credits that satisfy all the requirements for the BS and MS degrees, with 6 credits overlap. Students take 6 credits of 500-level courses as part of their technical electives or substitutes for required courses as part of their 121-credit undergraduate program. Students may take additional graduate-level courses as part of their BS technical electives with advisor approval. These additional graduate-level courses will not count toward the MS degree. Students admitted to the accelerated program must maintain an overall GPA of at least 3.00 during the MS program and present a GPA of at least 3.00 for the 24 credits of graduate work submitted for the MS degree.

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>TCOM 535</td>
<td>The TCP/IP Suite of Internet Protocols</td>
<td>3</td>
</tr>
<tr>
<td>TCOM 551</td>
<td>Digital Communication Systems</td>
<td>3</td>
</tr>
</tbody>
</table>

Select an additional 500-level TCOM course(s) from the list below

- BIS 300 Understanding Interdisciplinary Studies 3
- BIS 390 The Research Process 3
- BIS 490 RS: Senior Project (Mason Core) 3
- BIS 491 Senior Project Presentation 1
- ECE 301 Digital Electronics 3
- IT 341 Data Communications and Network Principles 3

TCOM 500 Modern Telecommunications 3
Select additional courses related to telecommunication 1 9-21
Total Credits 31-43

1 Required to reach the necessary number of credits for the BIS Individualized concentration.

Degree Conferral
Students must apply to have the BS conferred the semester before they expect to complete the BS requirements. At the completion of the MS requirements, the MS degree will be awarded.

Individualized Study, BIS/Telecommunications, Accelerated MS

Overview
Highly-qualified students in the Individualized Study, BIS have the option of obtaining an accelerated Telecommunications, MS.

For more detailed information, see AP.6.7 Bachelor’s/Accelerated Master’s Degrees. For policies governing all graduate degrees, see AP.6 Graduate Policies.

Admission Requirements
Students in the Individualized Study, BIS may apply for this option if they have earned 90 undergraduate credits (including 15 Mason resident credits) with an overall GPA of at least 3.25. Criteria for admission are identical to criteria for admission to the Telecommunications, MS program.

Accelerated Option Requirements
Students must complete all requirements for the BIS and MS programs, with 6 credits overlap.

Students select TCOM courses from the list below to meet the requirements of the accelerated program. Six credits of TCOM courses will be applied to meet the requirements of both the BIS and MS TCOM programs. An additional three credits of TCOM courses is required for the BIS Individualized Concentration (IND) with emphasis on telecommunication. Note that accelerated students can only take the courses in the list below if they passed the listed prerequisite course with a B or higher.

BIS Concentration
Total credits: 34-46

Students who are pursuing the Individualized Study, BIS, Individualized concentration (IND) with an emphasis on telecommunications must take:

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>BIS 300</td>
<td>Understanding Interdisciplinary Studies</td>
<td>3</td>
</tr>
<tr>
<td>BIS 390</td>
<td>The Research Process</td>
<td>3</td>
</tr>
<tr>
<td>BIS 490</td>
<td>RS: Senior Project (Mason Core)</td>
<td>3</td>
</tr>
<tr>
<td>BIS 491</td>
<td>Senior Project Presentation</td>
<td>1</td>
</tr>
<tr>
<td>ECE 301</td>
<td>Digital Electronics</td>
<td>3</td>
</tr>
<tr>
<td>IT 341</td>
<td>Data Communications and Network Principles</td>
<td>3</td>
</tr>
<tr>
<td>TCOM 500</td>
<td>Modern Telecommunications</td>
<td>3</td>
</tr>
</tbody>
</table>

Select additional courses related to telecommunication 1 9-21
Total Credits 31-43

1 Required to reach the necessary number of credits for the BIS Individualized concentration.

Telecommunications Courses

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>TCOM 500</td>
<td>Modern Telecommunications</td>
<td>3</td>
</tr>
<tr>
<td>TCOM 530</td>
<td>Data Communications Fundamentals</td>
<td>3</td>
</tr>
<tr>
<td>TCOM 535</td>
<td>The TCP/IP Suite of Internet Protocols</td>
<td>3</td>
</tr>
<tr>
<td>TCOM 551</td>
<td>Digital Communication Systems</td>
<td>3</td>
</tr>
<tr>
<td>TCOM 607</td>
<td>Satellite Communications</td>
<td>3</td>
</tr>
<tr>
<td>TCOM 608</td>
<td>Optical Communications Systems</td>
<td>3</td>
</tr>
<tr>
<td>TCOM 631</td>
<td>Voice Over IP</td>
<td>3</td>
</tr>
</tbody>
</table>

Note:
Accelerated students who have passed IT 341 Data Communications and Network Principles with a grade of B or higher will not be required to take TCOM 530 in the Telecommunications, MS core. Other TCOM courses may be approved on a case-by-case basis.

See each course for individual prerequisite requirements.

Degree Conferral
Students must apply the semester before they expect to complete the BS requirements to have the BS degree conferred. In addition, at the beginning of the student’s final undergraduate semester, students must complete a Bachelor’s/Accelerated Master’s Transition form that is submitted to the Office of the University Registrar and the VSE Graduate Admissions Office. At the completion of MS requirements, a master’s degree is conferred.

Information Technology, BS/Telecommunications, Accelerated MS
Overview
Highly-qualified students in the Information Technology, BS have the option of obtaining an accelerated Telecommunications, MS.

Admission Requirements
Students in the Information Technology, BS program may apply for this option if they have earned 90 undergraduate credits with an overall GPA of at least 3.25. Criteria for admission are identical to criteria for admission to the Telecommunications, MS program.

Accelerated Option Requirements
Students must complete all credits that satisfy requirements for the BS and MS programs.

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>TCOM 500</td>
<td>Modern Telecommunications (To satisfy the IT 300 BS, AIT requirement)</td>
<td>3</td>
</tr>
<tr>
<td>TCOM 530</td>
<td>Data Communications Fundamentals (To satisfy the IT 341 BS, AIT requirement)</td>
<td>3</td>
</tr>
<tr>
<td>TCOM 535</td>
<td>The TCP/IP Suite of Internet Protocols (To satisfy the IT 441 BS, AIT requirement)</td>
<td>3</td>
</tr>
<tr>
<td>TCOM 631</td>
<td>Voice Over IP (To satisfy the IT 484 BS, AIT requirement)</td>
<td>3</td>
</tr>
</tbody>
</table>

Total Credits: 6

Note:
Students in the accelerated option who have passed IT 341 Data Communications and Network Principles with a grade of B or higher will not be required to take TCOM 530 Data Communications Fundamentals, which is listed in the MS TCOM core. Alternative sections of TCOM courses to satisfy requirements in the AIT undergraduate program may be made with the approval of the undergraduate academic advisor.

Systems Engineering, BS/Telecommunications, Accelerated MS
Overview
Highly-qualified students in the Systems Engineering, BS have the option of obtaining an accelerated Telecommunications, MS.

Admission Requirements
Students in the Systems Engineering, BS program who preferably have chosen to take the systems engineering of telecommunications elective sequence may apply to this option if they have earned 90 undergraduate credits with an overall GPA of at least 3.30 and completed all MATH and PHYS requirements. Other students will be considered on their individual merit. Criteria for admission are identical to criteria for admission to the Telecommunications, MS program.

Accelerated Option Requirements
Students must complete all credits that satisfy requirements for the BS and MS programs, with 6 credits overlap selected from the following courses:

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>TCOM 500</td>
<td>Modern Telecommunications</td>
<td>3</td>
</tr>
<tr>
<td>TCOM 530</td>
<td>Data Communications Fundamentals</td>
<td>3</td>
</tr>
<tr>
<td>OR 541</td>
<td>Operations Research: Deterministic Models</td>
<td>3</td>
</tr>
<tr>
<td>SYST 530</td>
<td>Systems Engineering Management I</td>
<td>3</td>
</tr>
<tr>
<td>SYST 573</td>
<td>Decision and Risk Analysis (if taken, replaces TCOM 521 in the telecommunications core requirements)</td>
<td>3</td>
</tr>
</tbody>
</table>

Degree Conferral
Students must apply the semester before they expect to complete the BS requirements to have the BS degree conferred. In addition, at the beginning of the student’s final undergraduate semester, students must complete a Bachelor’s/Accelerated Master’s Transition form that is submitted to the Office of the University Registrar and the VSE Graduate Admissions Office. At the completion of MS requirements, a master’s degree is conferred.