MASTER OF SCIENCE DEGREE PROGRAMS

- MASTER OF SCIENCE WITH SPECIALIZATION IN SOFTWARE ENGINEERING
- MASTER OF SCIENCE WITH SPECIALIZATION IN COMPUTER NETWORKING AND TELECOMMUNICATIONS
- MASTER OF SCIENCE WITH SPECIALIZATION IN INFORMATION SYSTEMS
- GENERAL MASTER OF SCIENCE IN COMPUTER SCIENCE
- MASTER OF SCIENCE FOR TEACHERS (M.S.T.)
This program is designed for those students who want to obtain a broad background in computer science. Students in this program are required to take courses in four core areas. In contrast to the specialized M.S. program, these courses may be selected from a wide range of options. The list below contains the core course offerings in the M.S. program:

**Theory**
- CS 524 Theory of Information Systems Design
- CS 530 Formal Theory of Computation
- CS 532 Formal Languages
- CS 535 Analysis of Algorithms
- CS 536 Science of Programming
- CS 537 Software Metrics
- CS 555 Analytic Models and Simulation of Computer Systems

**Systems Architecture**
- CS 521 Object Oriented Analysis and Design
- CS 542 Computer Networks I: Fundamentals
- CS 543 Advanced Topics in Computer Networks
- CS 544 Computer Networks II
- CS 545 Concurrent Programming
- CS 547 Wireless Networking
- CS 548 Seminar in Broadband Integrated Service Networks
- CS 550 Comparative Operating Systems
- CS 570 Comparative Computer Architecture
- CS 572 Advanced Computer Architecture
- CS 586 Software System Architecture

**Programming**
- CS 525 Advanced Database Organization
- CS 540 Syntactic Analysis of Programming Languages
- CS 541 Compiler Construction
- CS 546 Parallel Processing
- CS 551 Operating System Design and Implementation
- CS 581 Advanced Artificial Intelligence
- CS 588 Advanced Software Engineering Development

**Applications**
- CS 511 Advanced Topics in Computer Graphics
- CS 522 Data Mining
- CS 529 Information Retrieval
- CS 560 Computer Science in the Classroom
- CS 561 The Computer and the Curriculum Content
- CS 565 Computer-Assisted Instruction
- CS 580 Medical Informatics
- CS 582 Robotics
- CS 583 Expert Systems
- CS 584 Neural Networks
- CS 585 Natural Language Processing
- CS 587 Software Project Management
- CS 589 Software Testing and Quality Assurance
This program is designed to provide in-depth knowledge of the principles of design and development of information systems. In order to complete this specialization, the following conditions must be met:

1. Students must satisfy M.S. Program Requirements.
2. Students within this area of specialization are also required to select four specialization courses from the group of courses listed below (some specialization courses may also count as core courses):

- CS 521 Object-Oriented Analysis and Design
- CS 522 Data Mining
- CS 524 Theory of Information Systems Design
- CS 525 Advanced Database Organization
- CS 529 Information Retrieval
- CS 545 Concurrent Programming
MASTER OF SCIENCE WITH SPECIALIZATION IN COMPUTER NETWORKING AND TELECOMMUNICATIONS

This program is designed to provide an in-depth knowledge of theories and practices of the computer networking and telecommunications discipline. In order to complete this specialization, the following conditions must be met:

1. Students must satisfy M.S. Program Requirements.
2. Students within this area of specialization are also required to select four specialization courses from the group of courses listed below (some specialization courses may also count as core courses):
   - CS 542 Computer Networks I: Fundamentals
   - CS 543 Advanced Topics in Computer Networks
   - CS 544 Computer Networks II
   - CS 547 Wireless Networking
   - CS 548 Seminar in Broadband Integrated Service Networks
   - CS 555 Analytic Models of Simulation of Computers Systems
   - CS 595 Cryptography

MASTER OF SCIENCE WITH SPECIALIZATION IN SOFTWARE ENGINEERING
MASTER OF SCIENCE WITH SPECIALIZATIONS IN INFORMATION SYSTEMS
GENERAL MASTER OF SCIENCE IN COMPUTER SCIENCE
MASTER OF SCIENCE OF TEACHERS (M.S.T.)
This program is designed to provide an in-depth knowledge of theories and practices of the software engineering discipline and hands-on experience in software design, development, and maintenance. In order to complete this specialization the following conditions must be met:

1. Students must satisfy M.S. Program Requirements.
2. Students within this area of specialization are also required to select four specialization courses from the group of courses listed below (some specialization courses may also count as core courses).

- CS 536 Science of Programming
- CS 537 Software Metrics
- CS 586 Software System Architecture
- CS 587 Programming Project Management
- CS 588 Advanced Software Engineering Development
- CS 589 Software Testing and Quality Assurance
ADMISSION REQUIREMENTS FOR THE MASTER OF SCIENCE IN COMPUTER SCIENCE

A student can be admitted into one of the following graduate degree programs:

- Master of Science in Computer Science
- Ph.D. in Computer Science

A student can also be admitted as a Graduate Special Student in which case the student is a non-matriculated student, that is the student is not in a degree program.

Each program and admission as a Graduate Special Student requires a formal application and accompanying materials. Deadlines for the receipt of admission materials (application form, application fee, and supporting documents) for the degree programs are June 1 and November 1 for enrollment in the Fall and Spring semesters, respectively. If admission materials are received after these deadlines, the Admissions Committee may not be able to process the application before the beginning of the semester. Students may also apply for admission in the summer semester. Students who are applying for Teaching Assistantships should submit the CS 10 form by March 1 or October 1 along with a resume and cover letter to the Associate Chairman. Applications for Graduate Special Students should be completed before registration begins for the semester of admission. All applications except for Graduate Special Students are evaluated by the Graduate Admissions Committee of the Department.

The following sections describe the minimum requirements for the M.S. programs. Satisfying the minimum requirements does not automatically imply admission.
APPLICATION DOCUMENTS REQUIRED FOR THE M.S. IN COMPUTER SCIENCE

Students must complete an application for admission as a matriculating graduate student. Along with the application, official or certified copies of all transcripts must be submitted along with at least two letters of recommendation. In addition, applicants from countries whose native language is not English must submit an official TOEFL exam score, unless they have received a degree from an accredited U.S. institution. All applicants must also submit scores from the GRE general exam.

ADMISSION REQUIREMENTS
ADMISSION REQUIREMENTS INTO THE M.S. IN COMPUTER SCIENCE

The minimum standards for admission into the M.S. in Computer Science program are as follows:

1. A Bachelor’s degree in Computer Science with a minimum overall GPA of 3.0/4.0 or its equivalent. For students from the Indian educational system a “First Class” four year degree is required.
2. For non-English speaking applicants without a U.S. degree, a minimum TOEFL score of 550 is required. If the TOEFL score is less 600, the applicant is required to take the English Proficiency Exam administered by the IIT Humanities Department. Graduate students with degrees from English-speaking countries are not required to submit the TOEFL score. Please check with the Graduate College for details at the following web page: 
   http://www.grad.iit.edu/graduatecollege/insidepages/admissionfaq%27s.html#testing4
   Note that Puerto Rican students must submit the TOEFL score.
3. All applicants for Regular graduate admission (degree-seeking) must submit GRE scores prior to admission. Domestic students without GRE scores may be admitted as Special students until they submit their GRE scores. Combined general GRE score (verbal, analytical, quantitative) minimum is 1400. Meeting the minimum GPA and test score requirements does not guarantee admission. Test scores and GPA are just two of several important factors considered.
4. Two letters of recommendation.

Students who transfer from Master’s degree programs at other universities may apply up to 6 hours of graduate credits (grade of “B” or better) towards their M.S. degree at IIT.

Applicants with Bachelor’s degree in other disciplines can be admitted to an M.S. program in Computer Science. However, students whose training does not include the equivalent of CS 200 (introduction to C++ programming), CS 330 (Discrete Structures), CS 331 (Data Structures and Algorithms), CS 350 (Computer Organization and Assembly Language Programming) and CS 351 (Systems Programming) will be required to either complete all of the courses in which a deficiency exists or complete the sequence of the following two courses:

- CS 401 (Introduction to Advanced Studies I) and
- CS 402 (Introduction to Advanced Studies II).

In addition, students who have not had at least one course in calculus will be required to take a course in calculus. Note that these fundamental prerequisite courses do not count toward the 32 semester hours required by the M.S. program.

APPLICATION DOCUMENTS REQUIRED
DEGREE PROGRAMS

REQUIREMENTS FOR THE M.S. IN COMPUTER SCIENCE

FUNDAMENTAL PREREQUISITES

THE M.S. PROGRAMS

M.S. PROGRAM REQUIREMENTS

CORE COURSES

TRANSFER OF COURSE CREDITS FROM OTHER UNIVERSITIES

ESTABLISHING A PROGRAM OF STUDY

MODIFYING A PROGRAM OF STUDY

COMPLETION OF THE MS DEGREE - THE THREE OPTIONS

APPLYING FOR GRADUATION

LEAVES OF ABSENCE

TIME LIMIT

DROPPING COURSES

TRANSFERRING FROM OTHER IIT DEPARTMENTS
REQUIREMENTS FOR THE M.S. IN COMPUTER SCIENCE

Fundamental Prerequisites

Students whose academic background does not include the equivalent of CS 200, CS 330, CS 331, CS 350, and CS 351 (see the course descriptions) will be required to either:

- complete those courses in which a deficiency exists, or
- complete CS 200, and CS 401 and CS 402.

A student who is required to take n prerequisite courses as a condition for admission, must complete them in n semesters. If the student does comply, he/she will be removed from the graduate program. The prerequisite courses CS 401 and CS 402 must be taken at IIT. A student taking a prerequisite course(s) that is required as a condition for admission must earn a grade of "B" or better.

If a student wishes to be exempt from CS 401 or CS 402 based on industrial experience or previous course-work, the student must take, and pass the exemption exam in their first semester at IIT.

In addition, students who have not had at least one course in calculus will be required to take a course in calculus. Note that these prerequisite course do not count toward the 32 semester hours required by the M.S. Program.
The M.S. Programs

There are four options available to students in the M.S. program:

- The General M.S. in Computer Science
- M.S. with a specialization in Software Engineering
- M.S. with a specialization in Computer Networking and Telecommunications
- M.S. with a specialization in Information Systems

The specialized M.S. degree programs address the needs of those students who want to specialize in a particular area of computer science. A student desiring a broader-based computer science graduate education can enter the general M.S. program.

Courses are normally 15 weeks (1 semester) in length; however, each year several short courses are offered during the intersession periods to permit students to accelerate the completion of degree requirements.
M.S. Program Requirements
The M.S. degree requirements are as follows:

1. A minimum of 32 credit hours (advisor approved).
2. A student must take at least one course in each of the core areas of Systems, Theory, Programming, and Applications.
3. A GPA of at least 3.0/4.0 in the program of study.
4. To complete the MS program a student must choose one of the following three options:
   - Option 1: This option consists of 32 credit hours of course work.
   - Option 2: Master's Project - this option consists of course work and up to five hours of CS 597 for a total of 32 hours. The result is a project consisting of a high-quality paper or piece of software, followed by an oral defense.
   - Option 3: Master's Thesis - this option consists of course work and up to five hours of CS 591 for a total of 32 hours. With an advisor's consent up to eight hours of CS 591 may be applied towards a Master's thesis. The result is a Master's thesis, followed by an oral defense.

Students in the M.S. program must adhere to the following restrictions:

- A minimum of 20 credits of 500 level courses in computer science.
- A maximum of six credits of short courses. Short courses numbered CS 700 - CS 749 count as CS 4xx level courses; short courses numbered CS 750 - CS 799 count as CS 5xx level courses.
- A Program of Study (Form #401) must be filed before the student completes 12 credits.
- No more than six credits of applicable graduate level courses can be transferred from another institution (a grade of "B" or better is required in the transferred courses).
- Deficiency courses CS 401 and CS 402 do not count toward the M.S. program.
- A maximum of five credits of CS 597 for students who select Option 2.
- The time limit for completing the M.S. requirement is six years.
- No short course can count as a core course.
- Credits for participation in an IPRO (interprofessional Project) will not be counted towards the MS degree.
32 credit hours

This program is designed for those students who want to obtain a broad background in computer science. Students in this program are required to take courses in four core areas. In contrast to the specialized M.S. program, these courses may be selected from a wide range of options. The list below contains the core course offerings in the M.S. program:

**Theory**
- CS 524 Theory of Information Systems Design
- CS 530 Formal Theory of Computation
- CS 532 Formal Languages
- CS 535 Analysis of Algorithms
- CS 536 Science of Programming
- CS 537 Software Metrics
- CS 555 Analytic Models and Simulation of Computer Systems

**Systems Architecture**
- CS 521 Object Oriented Analysis and Design
- CS 542 Computer Networks I: Fundamentals
- CS 543 Advanced Topics in Computer Networks
- CS 544 Computer Networks II
- CS 545 Concurrent Programming
- CS 547 Wireless Networking
- CS 548 Seminar in Broadband Integrated Service Networks
- CS 550 Comparative Operating Systems
- CS 570 Comparative Computer Architecture
- CS 572 Advanced Computer Architecture
- CS 586 Software System Architecture

**Programming**
- CS 525 Advanced Database Organization
- CS 540 Syntactic Analysis of Programming Languages
- CS 541 Compiler Construction
- CS 546 Parallel Processing
- CS 551 Operating System Design and Implementation
- CS 581 Advanced Artificial Intelligence
- CS 588 Advanced Software Engineering Development

**Applications**
- CS 511 Advanced Topics in Computer Graphics
- CS 522 Data Mining
- CS 529 Information Retrieval
- CS 560 Computer Science in the Classroom
- CS 561 The Computer and the Curriculum Content
- CS 565 Computer-Assisted Instruction
- CS 580 Medical Informatics
- CS 582 Robotics
- CS 583 Expert Systems
- CS 584 Neural Networks
- CS 585 Natural Language Processing
- CS 587 Software Project Management
- CS 589 Software Testing and Quality Assurance
REQUIREMENTS FOR THE M.S. IN COMPUTER SCIENCE

Transfer of Course Credits from other Universities

At most nine credit hours of graduate CS courses (500 level) may be transferred from another college or university. The courses to be transferred:

- must have been available for graduate credit at the institution at which they were taken,
- must not have been used toward another degree,
- must have been passed with a grade of "B" or better, and
- must have been approved by a student's Computer Science Department advisor.
Establishing a Program of Study

Every student in the M.S. Program must file a Program of Study (Form #401) before completion of 12 semester hours at the 400 or 500 level. It is important to carefully select and schedule core courses and their prerequisites. Lack of care in scheduling may result in a student being required to take more than 32 semester hours in order to complete the M.S. Program. The remainder of a student's Program of Study is comprised of courses from Computer Science or related disciplines. These courses must result in a Program of Study that contains at least 32 semester hours. This form is prepared in consultation with a Computer Science Department advisor and lists all of the courses that a student plans to take as part of the M.S. Program (including courses that have already been completed). The Program of Study must be signed by the advisor and the Department Chair (or an Associate Chair).
Modifying a Program of Study

A Program of Study may be modified through the submission of Form #406. Form #406 must be signed by the advisor and the Department Chair (or an Associate Chair). Changes in the program may not be approved by the graduate dean after the student has filled an application for graduation.

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Completion of the M.S. Degree - The Three Options

A student may choose from three options to complete the M.S. program:

- **Option 1** 32 credit hours of course work. Option 1 is the option most frequently selected by students. A student must complete 32 hours of regular course work including electives and core courses with a GPA of 3.0/4.0 or better.

- **Option 2** Master's Project: Course work and up to 5 hours of CS 597 for a total of 32 hours. The result is a project that results in one of the following:
  1. A high quality paper that is submitted for publication as an article or as a technical report. Click here for a detailed description of Option 2.
  2. A high quality piece of software. The software should be of distribution quality, but can be proprietary.

- **Option 3** Master's Thesis: Course work and up to 5 hours of CS 591 for a total of 32 hours. The result is a Master's thesis. Click here for a detailed description of Option 3.
REQUIREMENTS FOR THE M.S. IN COMPUTER SCIENCE

A Detailed Description of Options 2 and 3

Students who select Options 2 and 3 must:

Obtain at least three "A's" and one "B" in four core courses, one in each of the four core categories.

A student must be registered in the semester in which the oral defense is taken.

The following steps are also required for Options 2 and 3:

1. The student must find a faculty member who is willing to work with him/her and supervise the thesis or project. Faculty members will customarily agree to serve as a thesis or project advisor only when they have an interest in the topic and a high degree of confidence in the ability of the student to complete the thesis or project. A student has no right to insist on doing Options 2 or 3. A student who cannot find a faculty advisor who will agree to work with him/her on a thesis or project must take Option 1.

2. When the advisor and the student have formulated a plan for the work to be done, a thesis or project defense committee must be formed. With the concurrence of the advisor, the student asks at least one other member of the faculty to serve on the committee. Once the members of the committee have been identified, the student must prepare a written description of the thesis or project on a CS 03 form and have this form signed by all of the committee members. Three additional copies of this form must be made, one for each committee member and one for the student. The original is retained in the student's file in the Computer Science department Office.

3. Once the thesis or project has been completed and a document describing the results prepared, the student must schedule an oral defense of this work. Notice of the defense must be posted at least 48 hours in advance on the Computer Science Department bulletin board. Note the timing of a thesis defense must meet the deadlines established by the Graduate School. In addition, the thesis itself must be in the format specified by the Graduate School. The student must also submit Forms #501A and #501B as prescribed in the thesis manual.

4. At the conclusion of the oral defense, the committee chair will report the result using a CS 06 form (this form must be signed by all of the committee members). A copy of this form is given to the students and the original is retained in the student's file. In addition, the committee chair will report the result using Form #303. Two additional copies of this form must be made, one for the student and one for the student's file. The original is sent to the Graduate Records Office.

5. Up to 5 semester hours of course credit may be applied toward a thesis or project. These should be taken as CS 591 (for a thesis) or CS 597 (for a project). In exceptional cases requiring departmental approval up to 8 hours of CS 591 or CS 597 may be applied toward a thesis or a project.

Note the following:

- All thesis and project defenses are open to the public.
- Options 2 and 3 have grade requirements associated with them. Students who have not yet completed their core course requirements must be aware that if these grade criteria are not met, they will be required either to take additional courses in order to satisfy these requirements, or complete the program with Option 1.
- Should a student fail the oral defense of a thesis or project (Options 2 and 3) for the second time, the committee must decide whether the student will be required to pursue Option 1. Every student has the right to appeal the results of a project or thesis defense by submitting an appeal in writing to the Department Chair within 2...
weeks of the notification of the result.

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Applying for Graduation

Each student who expects to receive a graduate degree in a given semester must file an application for graduation in the Graduate College within two weeks of the start of the intended semester of graduation. No application will be accepted after that date and no changes in a Program of Study are allowed after that date. An application for graduation is good for only one semester. If the student fails to graduate in the intended semester, a new application must be filled for a later semester (no additional fees will be charged for filling a second application).
Leaves of Absence

Regular students who intend to leave IIT for an extended period of time must file a Leave of Absence. A leave of absence will not be granted for more than one year, at which time a request for an extension of leave may be submitted. A leave of absence will not extend the time limit required for the completion of a degree. A leave will not be approved after the sixth week of the current semester.
Requirements for the M.S. in Computer Science

Time Limit

Every student is given up to six calendar years to complete the M.S. Program. This time interval begins with the first course listed on the student's M.S. Program of Study. Should this time limit expire, the student will be required to petition the Dean of the Graduate School to have the time limit extended. Such an extension will require the revalidation of course work and examinations, a time-consuming and expensive process.
REQUIREMENTS FOR THE M.S. IN COMPUTER SCIENCE

Dropping Courses

In order to officially drop a course, a student must file a Drop Form with the Registrar's Office (IITV students should consult with the IITV Office). This form must be filed before the final drop date given in that semester's course schedule. The student should retain a copy of the Drop Form receipt until a final grade report is received from the Registrar's Office. The student should also notify the course instructor of the decision to drop the course.

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**Transferring Courses from other IIT Departments**

Students may transfer courses from IIT departments outside of Computer Science into their Computer Science Degree Program. Click here for the approved course transfer list. The course transfer criteria are as follows:

1. The course must be listed on the course transfer list.
2. The student must achieve a grade of "B" or better in the course to be transferred.
3. If the student has a BS/BA in Computer Science up to 6 credit hours can be transferred from the list. If the student does not have a Bachelor's degree in Computer Science, only 3 credit hours will be transferable.
4. Since the Stuart School is on the quarter system, a total of 2 transfer credits will be allocated for a course from this department.

**Fundamental Prerequisites**

**The M.S. Programs**

**M.S. Program Requirements**

**Core Courses**

**Transfer of Course Credits from Other Universities**

**Establishing a Program of Study**

**Modifying a Program of Study**

**Completion of the M.S. Degree - The Three Options**

**Applying for Graduation**

**Leaves of Absence**

**Time Limit**

**Dropping Courses**
Requirements for the M.S. in Computer Science

Course Transfer List

Biology
BIO 550

Chemistry
CHEM 513

Electrical and Computer Engineering
ECE 502    ECE 511    ECE 529    ECE 563    ECE 587
ECE 504    ECE 513    ECE 530    ECE 566    ECE 588
ECE 505    ECE 514    ECE 540    ECE 570
ECE 506    ECE 515    ECE 541    ECE 581
ECE 508    ECE 519    ECE 545    ECE 584

Stuart School of Business (2 credit hours for each course transferred)
MBA 540    MSC 560    MSC 573    IM 542
MSC 562    MSC 534    MSC 564    MSC 538
MSC 570    MSC 546    MSC 571

Chemical Engineering (students not in the joint CS/Chem Engineering program can only transfer one of these courses)
CHE 507    CHE 533    CHE 508    CHE 536
CHE 528    CHE 560    CHE 532

Civil and Architectural Engineering
CAE 523    CAE 534    CAE 573

Mechanical Engineering
MMAE 500    MMAE 538    MMAE 501    MMAE 544
MMAE 505    MMAE 545    MMAE 506    MMAE 547
MMAE 517    MMAE 551

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