# Computer Science, BS

Computer Science is a dynamic discipline, constantly growing and evolving continuously. It regularly experiences revolutionary transformation. The major in Computer Science seeks to train computer scientists who can adapt and grow along with their chosen profession. The major provides a coherent framework in which the student can situate their developing knowledge and technical skills amid the central ideas and methods of the discipline. Its goal is to empower students to succeed in today's environment as well as tomorrow's.

Within a few years of graduation, the Department of Computer Sciences expects graduates to be applying the skills, knowledge and values developed in their studies to solve problems and to effect positive changes in a complex world. Specifically, our graduates will:

- Demonstrate peer-recognized expertise to solve meaningful problems in computing, technology and other fields, as employees in industry or government, students seeking advanced degrees, or merely as engaged citizens#
- Demonstrate commitment to teamwork, communicating and collaborating effectively with colleagues, clients and those in other fields#
- Demonstrate engagement in professional, legal, ethical and leadership responsibilities in their profession and in their community; and
- Demonstrate adaptability to evolving technology and workforce needs through continued learning to become a lifelong endeavor, especially in the computing realm.

## Degree Requirements

The College of Arts and Sciences curricular requirements are organized around these essential components:

- The development of fundamental skills of critical inquiry, analysis and expression.
- The development of appreciation for the spiritual and creative dimensions of human life and culture.
- The development of a responsible commitment to the broader social and political communities in which we live.

The college challenges students to embrace, seek to understand and engage actively in the complexities of the world in which we live. Courses in the Marquette Core Curriculum (MCC), drawn from the different disciplines within the humanities, natural sciences and social sciences, provide multiple perspectives and methods of inquiry. The MCC serves as the foundation for the intellectual growth of our students as they pursue their majors and professional disciplines, and as they develop into men and women who dedicate their lives to the service of others.

Courses in the majors provide in depth knowledge and skills concerning a particular area of study. The college offers a wide variety of discipline-based majors in the Humanities (English, History, Philosophy, Theology and Languages, Literatures and Cultures); in the Social Sciences (Anthropology, Criminology and Law, Economics, Political Science, Psychology, Sociology and Social Welfare and Justice); and in the Sciences (Biology, Chemistry, Physics, Math, Statistics and Computer Science). In addition, a wide range of majors and minors are offered in interdisciplinary areas of study including Africana Studies, Bioinformatics, Cognitive Science and Gender and Sexualities Studies, among others.

The combination of courses required by the Marquette Core Curriculum and individual majors in the College of Arts and Sciences ensures that students are educated both broadly and deeply, in keeping with long-standing Jesuit educational ideals and principles.

### First-Year Seminar

Students are required to complete ARSC 1953 Exploring Arts and Sciences during the fall term of their first year at Marquette. Students in the Honors Program are exempt from this requirement. Advanced standing transfer students who have completed a similar course at another institution may ask the college to waive the requirement.

### Bulletin Year and Degree Audit

Undergraduate students must meet the graduation requirements that are outlined in the Undergraduate Bulletin in effect the year in which they enter Marquette. Substitutions or waivers for specific courses that are required for degree completion may occur, as determined by the Klingler College of Arts and Sciences.

Students who interrupt their enrollment from the university follow the degree requirements from the bulletin in effect during the academic year of their readmission. In rare cases, the college may determine that readmitted students fall under a different set of degree requirements than the academic year in which they are readmitted. Policies and regulations in effect at the time of return apply to all students, regardless of the term of initial enrollment.

It is the responsibility of students to know and fulfill the requirements for graduation specified for the selected plan. Students are encouraged to use the Academic Advisement degree audit system, which is accessed via their Student Center and tracks courses that have been completed, as well as the Marquette Core Curriculum, college curricular requirements and major/minor requirements toward degree completion.

### Grade Point

- Earn a minimum grade point average of 2.000 for graduation.
- Achieve a 2.000 grade point average in all courses in the major or minor.

## Credit Hours

Complete a minimum of 32 credit hours in upper-division Marquette courses (lower-division courses are numbered 1000 to 2999; upper-division courses are numbered 3000 and above).

## Other Requirements for Graduation

- Complete the formal online application for graduation available in the CheckMarq Student Center (https://checkmarq.mu.edu/), by the specific term deadlines for application, as published in the Academic Calendar (https://bulletin.marquette.edu/undergrad/academiccalendar/).
- The college adheres to the University Commencement Policy (https://bulletin.marquette.edu/policies/commencement/).

Although most students can fulfill the Marquette Core Curriculum requirements, the college curricular requirements, their major requirements and elective courses without exceeding 120 credits, certain combinations of major and minor fields may require more than the minimum. Students are urged, therefore, to consult an adviser before selecting a major and any additional majors or minors.

*It is the responsibility of students to know and to fulfill all university, Klingler College of Arts and Sciences and major department requirements (See the corresponding sections of this bulletin for additional information regarding the Marquette Core Curriculum, university graduation and residency requirements, college curricular requirements and department major and minor requirements).*

## University Graduation Requirement

### Undergraduate Graduation Policy

Students are required to graduate at the end of the term in which all degree requirements are completed. Degree requirements are those requirements, including university, college and all other requirements necessary to earn a minimum of one undergraduate degree and any declared degrees/majors/minors/concentrations. That is, additional degrees/majors/minors/concentrations may be earned; however, they must be completed in the same term as the first degree/primary major is completed. Except in the case of readmission, undergraduate students must meet the graduation requirements which are stated in the Undergraduate Bulletin issued for the year in which they entered Marquette. Substitutions or waivers for specific courses required for degree completion may occur, as determined by the college and/or the Marquette Core Curriculum committee.

Students who have interrupted their enrollment from the university, are normally obliged to follow the degree/major/minor/concentration requirements in effect at the time of readmission. Policies that are in effect at the time of the return, apply to all students, regardless of the term of initial enrollment. Students are responsible for keeping themselves informed of the requirements which apply in their particular cases. Students have faculty advisers available who assist in planning and implementing their plan of studies; however, it is ultimately each student's responsibility to know and fulfill the requirements for graduation specified for the selected plan. This should be done not only by utilization of specific advisers, but also with Academic Advisement, the university's online degree audit tool on CheckMarq provided to all undergraduates. With Academic Advisement, students track their degree progress until graduation. It is the responsibility of students to immediately bring any discrepancies found in Academic Advisement to the attention of their college.

A candidate for a baccalaureate degree must meet the following graduation requirements:

1. In all undergraduate colleges and programs, a minimum of 120 credits earned and a cumulative grade point average of 2.000 is required for a Marquette undergraduate degree.
2. Credits required to be completed in residence at Marquette:
   a. A minimum of 45 total credits must be completed at Marquette. Up to 15 of the 45 credits may be completed through an approved study abroad program.
   b. A minimum of 32 upper-division credits must be completed at Marquette. This may include upper-division credits from an approved study abroad program.
   c. The final 30 credits needed to complete a Marquette undergraduate degree must be completed at Marquette, unless those credits are earned in an approved study abroad program, or are earned as part of a written/contractual agreement with another institution, in which Marquette students participate during the final year of their degree program.
   d. A minimum of one-half of credits in the major, minor, and concentration not attached to a major must be completed at Marquette.
3. Students must attend all courses, lectures, or any other exercises that are required, even though, in some cases such activities receive no recognition in terms of credit hours.
4. Students' records must be cleared of all grades that are not permanent, i.e., grades of I, IC, IE and NG.
5. Students must file the online application for a degree by the deadline published in the Academic Calendar (https://www.marquette.edu/central/registrar/calendars-exams-schedules.php); however, because students are required to graduate at the end of the term in which all university, degree requirements are complete, the university reserves the right to graduate a student without a graduation application on file. If the university exercises this option, there is no guarantee students will be able to participate in Commencement.
6. Commencement is held in May, after the spring term. Participation in Commencement does not mean students are graduated. See the Commencement Policy (https://bulletin.marquette.edu/policies/commencement/) in this section for further details.
7. Exceptions to this Graduation Requirements policy must be approved by the Office of the Provost, except:

- the course and bulletin year exceptions listed in the 'Graduation Requirements' section above (as approved by the college)
- number 3 above (as approved by the college)
- the dean's office in the college where the student's program resides may exempt up to 6 of the final 30 credits from being completed in residence (number 2c above)

For additional college requirements, consult the Degree Requirements listed for each undergraduate program in this bulletin.

**Special Note for 2023-2024**: Students who attended Cardinal Stritch University in a bachelor's degree program during the 2022-2023 year and directly transfer to a bachelor's degree program at Marquette University in Fall 2023 or Spring 2024 with fewer than 45 credits remaining in their Marquette program are exempted from the standard Marquette residency requirement (items 2-6 listed above). In lieu of the standard residency requirement, exempted students must complete all remaining credits for their undergraduate degree at Marquette. Exempted students are expected to remain continuously enrolled (fall and spring terms) at Marquette until the completion of their bachelor's degree.

## Graduation Latin Honors

The grade point average is used to compute graduation Latin honors. The computation is made by dividing the total number of grade points earned at Marquette University by the total number of grade point hours earned. The official Marquette GPA of all students is calculated by the student information system and this GPA is not rounded up or down for any reason. To graduate with Latin honors, candidates must be pursuing their first bachelor's degree, earned at least 60 grade point hours and 60 degree hours at Marquette University, normally as a junior and senior. First bachelor's degree is defined as the first bachelor's degree earned from any institution. When students earn a concurrent additional bachelor's degree (i.e., finish in the same term as the first bachelor's degree), the additional degree is also eligible for Graduation Latin Honors, if the first bachelor's degree qualifies.

Graduates whose grade point average is 3.500, graduate with cum laude (Latin for 'with honor'); graduates whose grade point average is 3.700, graduate with magna cum laude (Latin for 'with great honor'); and graduates whose grade point average is 3.900, graduate with summa cum laude (Latin for 'with highest honor'). Graduation Latin honors are recorded on diplomas, noted in the published lists of graduates at Commencement and recorded on students' transcript.

## Graduation Record

The academic record of students is frozen once the degree is posted and may not be altered thereafter, unless required to do so by law and/or a documented university error is discovered after the degree is posted. This includes, but is not limited to: all relevant grade point averages, grades, additional information relating to the degree(s), major(s), minor(s), concentration(s), Latin Honors and academic censure.

# Marquette Core Curriculum (MCC) - 30 Credits

## Foundation Tier - 15 Credits

| Code | Title | Hours |
|---|---|---|
| ENGL 1001 | Foundations in Rhetoric | |
| or HOPR 1955H | Core Honors First-Year Seminar | |
| PHIL 1001 | Foundations in Philosophy | |
| or PHIL 1001H | Honors Foundations in Philosophy | |
| THEO 1001 | Foundations in Theology: Finding God in all Things | |
| or THEO 1001H | Honors Foundations in Theology: Finding God in all Things | |
| CORE 1929 | Foundations in Methods of Inquiry | |
| or CORE 1929H | Honors Foundations in Methods of Inquiry | |
| Engaging Social Systems and Values 1 (ESSV1) | | |

## Engaging Social Systems and Values 1 (ESSV 1) Course Options

Some faculty-led study abroad courses have also been approved for ESSV1, consult the MCC website (https://www.marquette.edu/core-curriculum/mcc-study-abroad.php) for a complete list.

| Code | Title | Hours |
|---|---|---|
| ANTH 1001 | Being Human | 3 |
| EDUC 1001 | Child and Adolescent Development and Learning | 3 |
| ENGL 2020 | Texts, Social Systems and Values | 3 |
| ENGL 2030 | Global Literatures | 3 |
| HEAL 1025 | Culture and Health [1] | 3 |
| HIST 1101 | Introduction to American History | 3 |
| HIST 1601 | Difference and Democracy | 3 |
| HIST 1701 | Engaging the World | 3 |

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|---|---|---|
| HOPR 2956H | Honors Engaging Social Systems and Values 1: Engaging the City | 3 |
| INGS 1001 | Introduction to Gender and Sexualities Studies | 3 |
| SOCI 1001 | Principles of Sociology | 3 |
| SOWJ 1001 | Introduction to Social Welfare and Justice | 3 |
| SPAN 3300 | Peoples and Cultures of Spain | 3 |
| SPAN 3310 | Peoples and Cultures of Latin America | 3 |

[1]    Honors (H) designation of same course number also fulfills MCC requirement.

## Discovery Tier - 12 Credits

Students must complete **four** Discovery Tier courses, all from the **same** Discovery Theme. These four courses must include one course from each of the three content areas (Humanities, Natural Science and Mathematics, and Social Science), and one elective (an additional course from any of the three content areas). A maximum of two courses in the Discovery Tier can be applied toward a primary major. Additional dual counting may be allowed towards college-level requirements.

Students declare their Discovery Theme using the Discovery Tier Declaration Form (https://www.marquette.edu/central/registrar/how-do-i-declare-change-mcc-discovery-tier-theme.php) in CheckMarq.

For students who participate in a full-time (12 credits or more) Marquette-approved study abroad program, one study abroad course (minimum 2.5 transfer credits awarded) may fulfill the elective requirement of the Discovery Tier. Any additional MCC requirements may be fulfilled only when the approved transfer equivalent is an exact match to a specific MCC course.

### Discovery Themes

The five discovery theme options are listed below.  See additional information and course listings (https://bulletin.marquette.edu/resources-opportunities/marquette-core-curriculum/#discoverythemestext).

- Basic Needs and Justice

- Cognition, Memory and Intelligence

- Crossing Boundaries: The Movement of People, Goods and Ideas

- Expanding Our Horizons

- Individuals and Communities

## Culminating Course - 3 Credits

| Code | Title | Hours |
|---|---|---|
| CORE 4929 | The Service of Faith and Promotion of Justice | |
| or CORE 4929H | Honors Service of Faith and Promotion of Justice | |

## ENGAGING SOCIAL SYSTEMS AND VALUES 2 (ESSV2) - ONE COURSE or Experience Required

Students must complete a course or approved experience that is designated "ESSV2."  This requirement can be completed via one of the four Discovery Tier courses or through other degree requirements.

Some faculty-led study abroad courses have also been approved for ESSV2, consult the MCC website (https://www.marquette.edu/core-curriculum/mcc-study-abroad.php) for a complete list.

| Code | Title | Hours |
|---|---|---|
| ADPR 4750 | Strategic Communication in a Culturally Diverse Marketplace | 3 |
| ADVE 3986 | Internship in Advertising | 3 |
| ANTH 3100 | Urban Anthropology | 3 |
| ANTH 3986 | Internship in Anthropology | 3 |
| ANTH 4986 | Advanced Internship in Anthropology | 3 |
| ARBC 3200 | Culture and Civilization of the Middle East (WRIT) | 3 |
| ARBC 3220 | Arab and Muslim Women in the United States (WRIT) | 3 |
| ARSC 4953 | Seminar In Urban Social Issues | 3 |
| BISC 3929 | Reflective Analysis of Global Dental Brigade | 0 |

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| BISC 4460 | Practical Cases in Medicine | 3 |
| BULA 4001 | Business Law for Accounting | 3 |
| CCOM 4986 | Corporate Communication Internship | 0-3 |
| CHNS 3215 | Chinese Cuisine and Culture | 3 |
| CMST 3120 | Interpersonal Communication | 3 |
| CMST 4986 | Internship in Communication Studies | 0-3 |
| CNEN 3860 | Construction Materials and Methods | 3 |
| COMM 4986 | Internship in Communication | 0-3 |
| CRLS 2540 | Surveillance, Law and Society | 3 |
| CRLS 3150 | Reentry and Life After Incarceration | 3 |
| CRLS 3170 | Policy and Practice for Children Impacted by Incarceration | 3 |
| CRLS 3986 | Internship and Seminar in Criminology and Law Studies | 3 |
| CRLS 4986 | Advanced Internship and Seminar in Criminology and Law Studies | 3 |
| DGMD 3986 | Internship in Digital Media | 3 |
| EDUC 4965 | Student Teaching: Middle/Secondary | 15 |
| EDUC 4966 | Student Teaching: Elementary/Middle | 15 |
| EDUC 4986 | Community-Engaged Internship 1 | 3 |
| EDUC 4987 | Community-Engaged Internship 2 | 3 |
| ENGL 2001 | Ways of Knowing (WRIT) | 3 |
| ENGL 3140 | Sociolinguistics | 3 |
| ENGL 3249 | Creativity and Community | 3 |
| ENGL 3250 | Life-Writing, Creativity and Community (WRIT) | 3 |
| ENGL 3261 | Poetry and Community (WRIT) | 3 |
| ENGL 3780 | Water Is Life: Indigenous Art and Activism in Changing Climates (WRIT) | 3 |
| ENGL 4221 | The Rhetoric of Martin Luther King, Jr. and Malcolm X (WRIT) | 3 |
| ENGL 4222 | Feminist Rhetorics (WRIT) | 3 |
| ENGL 4223 | The Rhetoric of Black Protest (WRIT) | 3 |
| ENGL 4230 | Writing Center Theory, Practice and Research (WRIT) | 4 |
| ENGL 4453 | Romanticism and Nature (WRIT) | 3 |
| ENGL 4631 | Toni Morrison (WRIT) | 3 |
| ENGL 4825 | Native American / Indigenous Literatures (WRIT) | 3 |
| ENGL 4826 | Global Indigenous Literatures (WRIT) | 3 |
| ENGL 4988 | Practicum in Literature and Language Arts | 1-3 |
| EXPH 4986 | Exercise Physiology Practicum 2 | 6-16 |
| GEEN 2960 | Engineering Social Systems and Values | 0 |
| GRMN 3540 | Heckling Hitler | 3 |
| GRMN 3550 | German Reunification: The Collision of Two Worlds | 3 |
| HESC 3929 | Global Brigades Reflective Analysis | 0 |
| HIST 4120 | American Immigration | 3 |
| HIST 4125 | Latinx Civil Rights Movements | 3 |
| HIST 4135 | African-American History | 3 |
| HIST 4140 | American Urban History | 3 |
| HIST 4155 | A History of Native America | 3 |
| HIST 4247 | Comparative Homefronts during the Second World War | 3 |
| INPS 2010 | Introduction to Peace Studies | 3 |
| JOUR 3986 | Internship in Journalism | 0-3 |
| JOUR 4986 | Internship in Journalism | 0-3 |
| LLAC 1010 | Working Without Borders | 3 |
| LLAC 3220 | Cultures and Foodways | 3 |
| LLAC 3250 | Linguistic Diversity and Social Justice | 3 |
| MANA 3035 | Diversity in Organizations | 3 |
| MARQ 3929 | Engaging Social Systems and Values Reflective Analysis | 0 |

| MARQ 3961 | International Service Learning - Living Justice: Accompaniment in an Unjust World | 3 |
| NURS 3956H | Honors Nursing Practicum 1 | 1 |
| NURS 3965 | Community and Population Health Nursing - Clinical [1] | 2 |
| PHIL 3502 | Narrating Freedom: Gender, Race and Mass Incarceration | 3 |
| PHIL 3507 | Global Justice | 3 |
| PHTH 4512 | Culture and Disability | 3 |
| PSYC 3201 | Introductory Social Psychology | 3 |
| PSYC 3420 | Health Psychology | 3 |
| PURE 3986 | Internship in Public Relations | 0-3 |
| SOCI 3700 | Social Movements, Protest and Change | 3 |
| SOCI 3986 | Internship and Seminar in Sociology | 3 |
| SOCI 4986 | Advanced Internship and Seminar in Sociology | 3 |
| SOWJ 3170 | Policy and Practice for Children Impacted by Incarceration | 3 |
| SOWJ 3400 | Advocacy and Social Change: Theory and Practice | 3 |
| SOWJ 3986 | Internship in Social Welfare and Justice | 3 |
| SOWJ 4700 | Global Aid and Humanitarianism | 3 |
| SOWJ 4986 | Advanced Internship in Social Welfare and Justice | 3 |
| SPAN 3001 | Advanced Communication in Spanish | 3 |
| SPAN 4150 | Spanish in the United States | 3 |
| THAR 3620 | Multicultural Playwrights | 3 |
| THAR 4986 | Internship in Theatre Arts | 0-3 |
| THEO 2500 | Theologies of Nonviolence [1] | 3 |
| THEO 3250 | Contemplation and Action | 3 |
| THEO 3350 | Christian-Muslim Dialogue | 3 |
| THEO 3600 | Theology Engaging Culture | 3 |
| THEO 4270 | The Many Faces of U.S. Catholicism | 3 |
| THEO 4400 | Christian Faith and Justice [1] | 3 |

[1]    Honors (H) designation of same course number also fulfills MCC requirement.

## WRITING INTENSIVE COURSES (WRIT) - ONE COURSE REQUIRED

Students must complete a course that is designated "WRIT."  This requirement can be completed via one of their four Discovery Tier courses or through other degree requirements.

Some faculty-led study abroad courses have also been approved, consult the MCC website (https://www.marquette.edu/core-curriculum/mcc-study-abroad.php) for a complete list.

| Code | Title | Hours |
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| ACCO 4000 | Accounting Communications | 3 |
| ADPR 2200 | Media Writing | 3 |
| ANTH 2101 | Cultural Anthropology | 3 |
| ARBC 3200 | Culture and Civilization of the Middle East (ESSV2) | 3 |
| ARBC 3210 | Arabic Literature in English Translation | 3 |
| ARBC 3220 | Arab and Muslim Women in the United States (ESSV2) | 3 |
| BIOL 4102 | Experimental Molecular Biology | 3 |
| BIOL 4202 | Experimental Genetics | 3 |
| BIOL 4302 | Experimental Cell Biology | 3 |
| BIOL 4402 | Experimental Ecology and Field Biology | 3 |
| BIOL 4403 | Tropical Ecology in Panama | 3 |
| BIOL 4502 | Experimental Neurobiology | 3 |
| BIOL 4702 | Experimental Physiology | 3 |
| BIOL 4802 | Experimental Microbiology | 3 |
| BISC 4325 | Endocrinology | 3 |
| BUAD 4010 | Business in Film | 3 |

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| BULA 3001 | Legal and Ethical Environment of Business | 3 |
| CCOM 3250 | Corporate Writing | 3 |
| CMST 3000 | Theories in Communication Studies | 3 |
| CRLS 3050 | Methods of Criminological Research | 3 |
| CRLS 3150 | Reentry and Life After Incarceration | 3 |
| EDUC 4000 | Educational Inquiry 2: Advanced Topics | 3 |
| EDUC 4540 | Philosophy of Education | 3 |
| ELEN 3025 | Electrical Instrumentation Laboratory | 2 |
| ENGL 2001 | Ways of Knowing (ESSV2) | 3 |
| ENGL 2011 | Books that Matter | 3 |
| ENGL 2012 | Well Versed | 3 |
| ENGL 3000 | Introduction to Literary Studies | 3 |
| ENGL 3210 | Writing Practices and Processes | 3 |
| ENGL 3220 | Writing for Workplaces | 3 |
| ENGL 3221 | Technical Writing | 3 |
| ENGL 3222 | Writing for Health and Medicine | 3 |
| ENGL 3240 | Introduction to Creative Writing | 3 |
| ENGL 3241 | Crafting the Short Story | 3 |
| ENGL 3242 | Writing Science Fiction and Fantasy | 3 |
| ENGL 3245 | Creative Nonfiction | 3 |
| ENGL 3250 | Life-Writing, Creativity and Community (ESSV2) | 3 |
| ENGL 3261 | Poetry and Community (ESSV2) | 3 |
| ENGL 3301 | Here Be Monsters | 3 |
| ENGL 3302 | Crossing Over | 3 |
| ENGL 3410 | Drama | 3 |
| ENGL 3462 | Introduction to Gothic Fiction | 3 |
| ENGL 3513 | Modern Irish Literature | 3 |
| ENGL 3514 | Contemporary Irish Literature | 3 |
| ENGL 3517 | Memory and Forgetting in Contemporary Historical Fiction | 3 |
| ENGL 3751 | The Art of War | 3 |
| ENGL 3761 | Medicine and Literature | 3 |
| ENGL 3762 | Disability and Literature | 3 |
| ENGL 3780 | Water Is Life: Indigenous Art and Activism in Changing Climates (ESSV2) | 3 |
| ENGL 3785 | LGBTQ+ Narratives: Literature, Film, Theory | 3 |
| ENGL 3841 | Global Hip Hop | 3 |
| ENGL 3860 | The Russian Novel and the Search for Meaning | 3 |
| ENGL 4210 | Writing, Literacy, and Rhetoric Studies | 3 |
| ENGL 4220 | Rhetorical Theories and Practices [1] | 3 |
| ENGL 4221 | The Rhetoric of Martin Luther King, Jr. and Malcolm X (ESSV2) | 3 |
| ENGL 4222 | Feminist Rhetorics (ESSV2) | 3 |
| ENGL 4223 | The Rhetoric of Black Protest (ESSV2) | 3 |
| ENGL 4224 | Radical Writing: An Invitation to the Self | 3 |
| ENGL 4230 | Writing Center Theory, Practice and Research (ESSV2) | 4 |
| ENGL 4250 | Creative Writing: Fiction | 3 |
| ENGL 4260 | Creative Writing: Poetry | 3 |
| ENGL 4303 | Studies in the Medieval Imagination | 3 |
| ENGL 4311 | Themes in Medieval Literature | 3 |
| ENGL 4331 | Shakespeare | 3 |
| ENGL 4402 | The Novel to 1900 | 3 |
| ENGL 4412 | Transatlantic Literature, 1700-1900 | 3 |
| ENGL 4422 | British Literature of the Long 18th Century | 3 |
| ENGL 4423 | Legal Fictions of the Enlightenment | 3 |

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| ENGL 4453 | Romanticism and Nature (ESSV2) | 3 |
| ENGL 4472 | British Literature of the Victorian Period, 1837-1900 | 3 |
| ENGL 4616 | Moby-Dick | 3 |
| ENGL 4631 | Toni Morrison (ESSV2) | 3 |
| ENGL 4715 | Children's Literature | 3 |
| ENGL 4730 | What Is a Book? | 3 |
| ENGL 4734 | The Epic | 3 |
| ENGL 4738 | Poetry | 3 |
| ENGL 4739 | Words to Worlds | 3 |
| ENGL 4755 | Law and Literature | 3 |
| ENGL 4765 | Material Cultures | 3 |
| ENGL 4786 | Women Writers | 3 |
| ENGL 4810 | Comparative Race and Ethnic Studies | 3 |
| ENGL 4820 | Studies in Critical Race and Ethnic Studies | 3 |
| ENGL 4825 | Native American / Indigenous Literatures (ESSV2) | 3 |
| ENGL 4826 | Global Indigenous Literatures (ESSV2) | 3 |
| ENGL 4830 | Africana Literatures | 3 |
| ENGL 4932 | Topics in Writing | 3 |
| ENGL 4954 | Seminar in Creative Writing | 3 |
| ENGL 4997 | Capstone | 3 |
| EXPH 4020 | Clinical Case Management in Exercise Science | 3 |
| FREN 4110 | Advanced Grammar and Written Expression in French | 3 |
| FREN 4270 | French Holocaust Writings in English Translation | 3 |
| FREN 4280 | Creative Writing in French | 3 |
| GRMN 3500 | The Modern German Short Story | 3 |
| GRMN 3505 | The Modern German Short Story in English | 3 |
| HIST 1301 | History of Latin America | 3 |
| HIST 3104 | The Civil War Era | 3 |
| HIST 4210 | The Black Death | 3 |
| HIST 4460 | Race and History of South Africa | 3 |
| HIST 4955 | Undergraduate Seminar in History | 3 |
| JOUR 4150 | Investigative Reporting | 3 |
| MANA 3002 | Business and Its Environment | 3 |
| MLSC 4180 | Concepts in Clinical Education Methods and Practicum | 2 |
| NURS 4000 | Quality and Safety in Nursing | 3 |
| PHIL 3505 | Philosophy and Film | 3 |
| PHIL 3610 | Ancient Philosophy | 3 |
| PHIL 4540 | Philosophy of Education | 3 |
| PHTH 7505 | Patient/Client Management 3 [2] | 2 |
| PHTH 7974 | Clinical Education Experience 1 [3] | 4 |
| POSC 3101 | Writing and Argumentation in Political Science | 3 |
| PURE 3600 | Public Relations Writing | 3 |
| SOCI 3050 | Methods of Social Research | 3 |
| SPAN 3001 | Advanced Communication in Spanish | 3 |
| SPAN 3005 | Advanced Communication in Spanish for Heritage Speakers | 3 |
| SPAN 3500 | Texts, Images and Critical Thinking in Spanish | 3 |
| SPAN 3505 | Texts, Images, and Critical Thinking in Spanish for Heritage and Native Speakers | 3 |
| SPAN 4700 | Creative Writing in Spanish | 3 |
| STCM 3400 | Writing for Strategic Communication | 3 |
| THAR 4600 | Playwriting | 3 |
| THEO 3130 | Miracles [1] | 3 |
| THEO 3530 | Theology and Economics [1] | 3 |

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| THEO 4210 | History and Theology of the Christian East | 3 |
| THEO 4300 | The Question of God in a Secular Age [1] | 3 |
| THEO 4460 | Religion, Science and Ethics | 3 |

[1]    Honors (H) designation of same course number also fulfills MCC requirements.

[2]    With PHTH 7974 Clinical Education Experience 1

[3]    With PHTH 7505 Patient/Client Management 3

## Grade Minimums & Additional Information

- A grade of C or better is required in Honors MCC courses. A passing grade is required in non-Honors MCC courses.
- Review the Marquette Core Curriculum (https://bulletin.marquette.edu/resources-opportunities/marquette-core-curriculum/) section of the bulletin for additional information, including transfer student requirements and Discovery Theme details.

# Major in Computer Science

The major in computer science consists of ten required COSC courses (34 cr. hrs.) and 12 cr. hrs. of upper-division COSC elective courses, for a total of 46 cr. hrs. of COSC courses. In addition, each student must complete 23 cr. hrs. of mathematics and science course work, including five required MATH cognate courses (17 cr. hrs.), and two natural science cognate electives (at least 6 cr. hrs.), one of which must include a laboratory component.

| Code | Title | Hours |
|---|---|---|
| Required Computer Science Courses: | | |
| COSC 1010 | Introduction to Software Development | 4 |
| COSC 1020 | Object-Oriented Software Design | 4 |
| COSC 2100 | Data Structures | 3 |
| COSC 2200 | Hardware Systems | 4 |
| COSC 3100 | Algorithms | 3 |
| COSC 3250 | Operating Systems | 4 |
| COSC 3410 | Programming Languages | 3 |
| COSC 3820 | Social, Ethical and Professional Issues in Computer Science | 3 |
| COSC 4920 | Principles of Design | 3 |
| COSC 4998 | Senior Design Project | 3 |
| Electives - choose 12 credit hours of upper-division COSC courses. | | 12 |
| Required Mathematics Cognate Courses: | | |
| MATH 1450 | Calculus 1 | 4 |
| MATH 1455 | Calculus 2 | 4 |
| or MATH 1451 | Integral Calculus | |
| MATH 2100 | Discrete Mathematics | 3 |
| MATH 3100 | Linear Algebra and Matrix Theory | 3 |
| MATH 4720 | Statistical Methods | 3 |
| Natural Science Electives including Laboratory Component - choose at least 6 additional credit hours of BIOL, CHEM or PHYS; including at least one Laboratory course. | | 6 |
| **Total Credit Hours:** | | **69** |

**Note:**

- MATH 2100 Discrete Mathematics is the preferred course for a COSC major. For those seeking a double major in MATH or a minor in MATH, MATH 2350 Foundations of Mathematics can be accepted as a substitute.

## Computer Science B.S./M.S. or M.B.A. Accelerated Degree Programs

The Department of Computer Science offers an accelerated degree program (ADP) where eligible students may obtain both their B.S. degree in Computer Science and a professional master of science (M.S.) degree in Computing in five years.

Students are eligible to apply to this program as early as the final semester of their sophomore year. Students wishing to participate in the five-year program must apply and be admitted to the program before their senior year when they begin to take graduate credits. Minimal criteria for application to the ADP include a GPA of at least 3.000 in the following: two terms of courses in programming, two terms of courses on data structures and algorithms, and three courses in calculus and discrete mathematics.

For more detailed information, please refer to the Graduate School Bulletin and contact the Department of Computer Science.

Together with the Graduate School of Management, the Department of Computer Science offers an accelerated degree program that allows students to earn both their B.S. degree in Computer Science and a master of business administration (M.B.A.) within a five-year time period.

During the first four years of the program, students complete both their course work requirements for their Computer Science B.S. degree and the necessary prerequisite courses for the M.B.A. degree in the College of Business Administration. In addition, undergraduate students begin their M.B.A. graduate work in their senior year by taking two graduate-level courses.

To be considered for admission to the B.S./M.B.A. five-year program, applicants must formally apply to the Graduate School of Management during their junior year at Marquette University. For more detailed information and details of a typical five-year course work plan, please refer to the Graduate School of Management Bulletin and contact the Department of Computer Science or the Graduate School of Management.

## Typical Program for Computer Science Majors

**Freshman**

| First Term | Hours | Second Term | Hours |
| --- | --- | --- | --- |
| ARSC 1953 | 1 | COSC 1020 | 4 |
| COSC 1010 | 4 | ENGL 1001 or ESSV1 (MCC) | 3 |
| MATH 1450 | 4 | MATH 1455 | 4 |
| ENGL 1001 or ESSV1 (MCC) | 3 | PHIL 1001 or THEO 1001 (MCC) | 3 |
| Natural Science with Laboratory[3] | 4 | | |
| | **16** | | **14** |

**Sophomore**

| First Term | Hours | Second Term | Hours |
| --- | --- | --- | --- |
| COSC 2100 | 3 | COSC 3250 | 4 |
| COSC 2200 | 4 | COSC 3xxx/4xxx | 3 |
| MATH 2100 or 2350 | 3 | MATH 3100 | 3 |
| CORE 1929 (MCC) or elective | 3 | CORE 1929 (MCC) or elective | 3 |
| PHIL 1001 or THEO 1001 (MCC) | 3 | DSCV (MCC)[1,2] | 3 |
| | **16** | | **16** |

**Junior**

| First Term | Hours | Second Term | Hours |
| --- | --- | --- | --- |
| COSC 3410 | 3 | COSC 3100 | 3 |
| COSC 3xxx/4xxx | 3 | COSC 3820 | 3 |
| Natural Science elective[3] | 3 | MATH 4720 | 3 |
| DSCV (MCC)[1,2] | 3 | DSCV (MCC)[1,2] | 3 |
| DSCV (MCC)[1,2] | 3 | Elective | 3 |
| | **15** | | **15** |

**Senior**

| First Term | Hours | Second Term | Hours |
| --- | --- | --- | --- |
| COSC 4920 | 3 | COSC 4998 | 3 |
| COSC 3xxx/4xxx | 3 | COSC 3xxx/4xxx | 3 |
| CORE 4929 (MCC) or elective | 3 | CORE 4929 (MCC) or elective | 3 |

| Elective | 6 | Electives | 6 |
|---|---|---|---|
| | **15** | | **15** |

**Total Credit Hours: 122**

1   The four courses in the Discovery Tier (DSCV) of the MCC must be completed in the same theme and include the following content areas: Humanities (HUM), Social Science (SSC), Natural Science and Mathematics (NSM) and one elective (ELE), which is an additional course from any of the three content areas.  A maximum of two courses in the Discovery Tier can apply towards a primary major.

2   Students must also complete the Writing Intensive (WRIT) and Engaging Social System and Values 2 (ESSV2) requirements of the MCC. These requirements can be fulfilled through designated courses in the Discovery Tier or other degree requirements.

3   Must complete 6 cr. hrs. of Natural Science electives (BIOL, CHEM or PHYS), including at least one course with laboratory component.

## University Policies

- Academic Advising (https://bulletin.marquette.edu/policies/academic-advising/)
- Academic Censure - Undergraduate (https://bulletin.marquette.edu/policies/academic-censure/undergraduate/)
- Academic Integrity (https://bulletin.marquette.edu/policies/academic-integrity/)
- Academic Misconduct (https://bulletin.marquette.edu/policies/academic-misconduct-policy/)
- Academic Program Definitions (https://bulletin.marquette.edu/policies/academic-programs-defined/)
- Academic Standing (https://bulletin.marquette.edu/policies/academic-standing/)
- Accelerated Degree Programs (https://bulletin.marquette.edu/policies/accelerated-degree-programs/)
- Advanced Standing Credit - Undergraduate (https://bulletin.marquette.edu/policies/advanced-standing-undergraduate/)
- Attendance - Undergraduate (https://bulletin.marquette.edu/policies/attendance/undergraduate/)
- Audit - Undergraduate (https://bulletin.marquette.edu/policies/audit/)
- Awarding Diplomas and Certificates (https://bulletin.marquette.edu/policies/awarding-diplomas-certificates/)
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- Class Rank (https://bulletin.marquette.edu/policies/class-rank/)
- Classification - Undergraduate (https://bulletin.marquette.edu/policies/classification-undergraduate/)
- Commencement (https://bulletin.marquette.edu/policies/commencement/)
- Conferral of Degrees and Certificates (https://bulletin.marquette.edu/policies/conferral-degrees-certificates/)
- Course Levels (https://bulletin.marquette.edu/policies/course-levels/)
- Credit Hour (https://bulletin.marquette.edu/policies/credit/)
- Credit Load - Undergraduate (https://bulletin.marquette.edu/policies/credit-load/undergraduate/)
- Examinations (Midterm and Final) - Undergraduate (https://bulletin.marquette.edu/policies/examinations-midterm-final-undergraduate/)
- Faculty Grading (https://bulletin.marquette.edu/policies/faculty-grading/)
- Family Education Rights and Privacy Act-FERPA (https://bulletin.marquette.edu/policies/ferpa/)
- Grade Appeals (https://bulletin.marquette.edu/policies/grade-appeals/)
- Grading System - Undergraduate and Health Science Professional (https://bulletin.marquette.edu/policies/grading-system/undergraduate-healthscienceprofessional/)
- Graduation - Undergraduate (https://bulletin.marquette.edu/policies/graduation/undergraduate/)
- Immunization and Tuberculosis Screening Requirements (https://bulletin.marquette.edu/policies/immunization-and-tuberculosis-screening/)
- Last Date of Attendance/Activity (https://bulletin.marquette.edu/policies/last-dateof-attendance-activity/)
- Major and Minor Declaration - Undergraduate (https://bulletin.marquette.edu/policies/major-declaration/)
- Medical Withdrawal (https://bulletin.marquette.edu/policies/medical-withdrawal/)
- Military Call to Active Duty or Training (https://bulletin.marquette.edu/policies/militarycall-active-duty-training/)
- Non-Degree Undergraduate Students (https://bulletin.marquette.edu/policies/non-degree-undergraduate-students/)
- Readmission - Undergraduate (https://bulletin.marquette.edu/policies/readmission/)
- Registration - Undergraduate (https://bulletin.marquette.edu/policies/registration/undergraduate/)
- Repeated Courses - Undergraduate (https://bulletin.marquette.edu/policies/repeated-courses/undergraduate/)
- Second Language Course Placement - Undergraduate (https://bulletin.marquette.edu/policies/second-language-course-placement-undergraduate/)
- Second/Additional Bachelor Degree (https://bulletin.marquette.edu/policies/second-additional-bachelor-degree/)
- Student Data Use and Privacy (https://bulletin.marquette.edu/policies/student-data-use-privacy/)
- Study at Other Institutions - Undergraduate (https://bulletin.marquette.edu/policies/study-institutions/)
- Transcripts-Official (https://bulletin.marquette.edu/policies/transcripts-official/)

- Transfer (Internal) to Another Undergraduate College within the University (https://bulletin.marquette.edu/policies/transfer-internal-another-undergraduate-college-within-university/)
- Transfer Course Credit - Undergraduate (https://bulletin.marquette.edu/policies/transfer-course-credit-policy/undergraduate/)
- Withdrawal - Undergraduate (https://bulletin.marquette.edu/policies/withdrawals/undergraduate/)

## College of Arts and Sciences Policies

- Absences from Final Examinations (https://bulletin.marquette.edu/arts-sciences/policies/absences-final-examinations/)
- Academic Dismissal/Probation/Academic Alert (CAA) (https://bulletin.marquette.edu/arts-sciences/policies/dismissal-probation-alert/)
- Academic Integrity (https://bulletin.marquette.edu/arts-sciences/policies/academic-integrity/)
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- Majors and Minors (https://bulletin.marquette.edu/arts-sciences/policies/majors-minors/)
- Transfer Credit Policy (https://bulletin.marquette.edu/arts-sciences/policies/transfer-credit-policy/)