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**For all Computer Science Majors!**

This Student Advising Guide contains the following:

- Introduction
  - Student Responsibilities
  - Faculty Responsibilities
  - Chair Responsibilities
  - Declaring your Major and Obtaining Career Advice
  - Opportunities for Internship and/or Study Abroad
  - Selecting your Courses
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## A. Introduction

This student advising plan is for all Computer Science majors. If you are new to the program, welcome aboard! You are embarking on a professional journey to becoming a computer science (CS) professional. Computer science (CS) is the study of algorithms, including their formal and mathematical properties, hardware realizations and constraints, linguistic realizations, and applications. An algorithm is simply a procedure for solving a problem in a finite number of steps. The computer scientist designs, develops, and implements algorithms to solve important human problems.

You will find this degree quite challenging. This is so because CS is a wide, deep, and dynamic field that is constantly in flux. However, you will also find that becoming a CS professional is a rewarding, fulfilling, and potentially lucrative proposition. As an added incentive, you will find that the faculty members of the Computer Science Department are highly qualified and committed to help you along the journey to the realization of your career objective(s). This compendium represents part of our commitment to help you realize that dream.

## B. Student Responsibilities

As a CS major, you are expected to be a responsible and helpful member of the college community. You are also expected to work hard and smart. Here are some specific tips for you:

1. **Take responsibility for your learning.** Avoid the temptation of making desperate excuses when things do not go as desired.
2. **You are here to read for your degree.** Do much reading, and do it often. Pay attention to details, and learn to listen. These are three characteristics of a successful CS professional.
3. **Strive for excellence.** Challenge yourself to reject mediocrity as a first alternative; strive to exceed the ordinary.
4. **Take responsibility for your learning.** Do not allow yourself to fall behind in any course. Start your readings and assignments early. Resist the temptation of making excuses for any less than stellar performance that you may turn in; rather, use the occasion as a learning experience.
5. **Do not accept ignorance or lack of understanding as a comfort zone.** If you need clarification on a matter, ask for it. If you need more information, ask for it, and be prepared to read as well.
6. **Register for your courses early.** This will ensure that you are always doing the courses that are best for your career plans. Some of the Integrative Studies courses (ISP) courses tend to fill up quickly. If you are unsure about which ISP courses to take, or are experiencing difficulties finding the one(s) you are interested in, be sure to communicate with your advisor and/or the Department Chair.
7. **Declare your major early.** There are huge benefits for doing so, as clarified below.

### C. Faculty Responsibilities

Our CS faculty members are committed to making your experience here a very meaningful one. Below are some of our commitments to you:

1. **Excellent Teaching:** We are committed to excellence in teaching services. This includes (but is not confined to) thorough course and class preparations, responding to your questions in a timely, comprehensive, and respectful manner, making the subject matter interesting, challenging you to think critically, challenging you to strive for excellence.
2. **Excellence in Advising and/or Mentoring:** We are committed to providing you with sound professional advice in helping you achieve along your journey to your career objective(s). At minimum, this includes course selection and career advising, but could also develop in a rich mentoring experience.
3. **Ethical Conduct:** We are committed to a high standard of ethical conduct. As such, your academic record will be treated as confidential information.

### D. Chair Responsibilities

Your Department Chair has the responsibility of ensuring that the department's commitments to you are executed on an ongoing basis and in a manner that is consistent with the standards of the department and the institution. We operate an open door policy. This means that you may bring any matter of concern to you to the attention of the Department Chair, with the confidence that it will be handled professionally and ethically.

Reciprocally, the Chair expects students and faculty members will continue to uphold the standards of the CS Department and the institution.

### E. Declaring Your Major and Obtaining Career Advice

It is important to declare your major early. This will ensure that you complete your studies at the institution in a timely manner. Major Declaration Forms are available in the Department Chair's office. When you complete the Major Declaration Form, you are assigned an academic advisor, who has the responsibility of guiding you through your pursuit of the CS degree.

Be sure to have a conversation with your advisor and/or the Department Chair about your career objectives. This will provide us with useful information that can be used to guide you along your journey. If you are not sure what aspects of CS you want to seriously pursue, that is fine as well. The academic program is structured in a way to facilitate you honing your education and skills in one to three areas of specialization. To maximize your marketability, you are encouraged to pursue multiple (two or three) specializations. It is recommended that you have a conversation about your career aspirations with your advisor before the end of your first year, and again during your second year. You should have a clear sense of direction by the end of your second year, but preferably before.

## F. Opportunities for Internship and/or Study Abroad

The CS Department is grateful to various organizations within the periphery of the college community that have continued to offer internship opportunities to our CS majors. For new students, you typically need to complete your first two years before trying to find internship opportunities off-campus. However, there are also limited opportunities on the campus that you may be interested in. Our department is placing a heightened focus on internship opportunities for our majors, so it is likely that you will get updates on this matter from time to time. In the meantime, if you are interested in internship, contact the Academic & Career Advising (ACA) Office.

In addition, Keene State College operates a study-abroad project that provides students to study for a semester at another reputable institution. In the past, some of our CS majors have engaged in this initiative, to return with heightened motivation and self-confidence. The opportunity also gives you a chance to expand your worldview. If you are interested in participating in this initiative, be sure to discuss it with your advisor, and contact the Global Education Office (GEO).

## G. Selecting Your Courses

In selecting your CS courses, there are three important pieces of information that you need to be aware of. They are:

- CS Program Planning Sheet
- CS Degree Completion Plan
- CS Course Schedule Master Plan

An abridged version of the CS Program Planning Sheet appears in figure 1. It shows all Major Requirements courses that you need to complete. A more detailed version that includes ISP courses appears on your personalized Degree Progress Tracking (DPT) instrument which you have either already received from the department, or will be receiving shortly.

Figure 2 shows the four-year CS Degree Completion Plan. If you start as a first-year student in the fall semester, this plan will work perfectly for you. If you start in the spring semester, or are a transfer student, your plan will be adjusted to your personal circumstance.

The CS Course Schedule Master Plan is shown in figure 3. It tells you when you can expect various CS courses to be offered. In particular, please note that if you plan on pursuing the Software Engineering Specialization, you should take the courses CS360 and CS375 in the fall semester; similarly, if you plan on pursuing the Networking Specialization, you should take the courses CS320 and CS355 in the spring semester.

Figure 1: CS Program Planning Sheet

<b>MAJOR REQUIREMENTS [62 Credits]</b>		<b>INTEGRATIVE STUDIES PROGRAM REQUIREMENTS [40 Credits]</b>	
<b>Core Requirements [26 Credits]</b>		<b>Foundations [8 Credits]</b>	
ISCS140 Programming Foundations I		ITW: Thinking & Writing	
CS185 Programming Foundations II		IQL: Quantitative Literacy: (May be fulfilled by one of the following: IQLxxx, MATH120, MATH141, MATH172, MATH175, MGT202)	
ISCS150 Website Design & Construction or INCS160 Microcomputer Systems		<b>Perspectives [32 Credits, 8 of which must be at the 300/400 level]</b>	
CS215 Operating System Administration or CS265 Computer Architecture		<b>IA: Arts</b> — IAART, IAENG, IAFILM, IAMU, IATAD. Selection:	
CS280 Data Structures & Algorithms		<b>IH: Humanities</b> — IHAMST, IHCOMM, IHENG, IHFILM, IHFR, IHGER, IHHIST, IHHGS, IHJRN, IHPHIL, IHSP, IHWGS. Selection:	
One course from the following: CS205 Visual Programming, CS225 C++ Programming, CS230 Procedural Programming, or CS310 Systems Programming: C and Assembler		<b>IA/IH:</b> One additional course in either IA or IH not used above. Selection:	
CS293/CS493 Supervised Field Experience (2 credits)		<b>IN: Natural Sciences</b> — INASTR, INBIO, INCHEM, INCS, INENST, INHLSC, INGEOL, INMET, INPHYS, INSAFE. Selection:	
<b>Cognate Requirements [8 Credits]</b>		<b>IS: Social Sciences</b> — ISANTH, ISCS, ISECON, ISGEOG, ISPOSC, ISPSYC, ISSOC. Selection:	
MATH135 Discrete Mathematics for CS (Mathematics majors may have MATH225 and either MATH141 or MATH241 substituted for this requirement)		<b>IN/IS:</b> One additional course in either IN or IS not used above. Selection:	
MATH151 Calculus I, MGT101 Intro to Management, or INPHYS241 University Physics I		<b>II: Interdisciplinary</b> — One II-prefixed course. Selection:	
Also recommended: MATH152 Calculus II		<b>One additional ISP course</b> in any discipline not used above. Selection:	
<b>Specialization Electives [Minimum 28 Credits]</b>		<b>GENERAL ELECTIVES [18 Credits]</b>	
CS310 Sys. Programming: C & Assembler	CS460 Data Warehousing & Advanced SQL	Elective:	Elective:
CS320 Operating Systems Design **	CS490 Advanced Special Topics	Elective:	Elective:
CS340 Internet Programming **	CS495 Artificial Intelligence & Robotics	Elective:	Elective:
ISCS350 Sys. Analysis & Proj. Mgt.	CS496 Games Programming		
CS355 Computer Networks **	CS498 Independent Study		
CS360 Database Systems **	MATH152 Calculus II		
CS375 Software Engineering **	MATH231 Linear Algebra & Diff. Equations		
CS395 Mobile Computing	MATH225 Intro to Abstr./Discrete Maths.		
CS410 Advanced Software Development	MATH241 Probability & Statistics		
CS420 E-Commerce Development	MATH362 Math Modeling & Computing		
CS430 Prin. of Programming Languages	MGT301 Org. Theory & Behavior		
CS440 Software Engineering Project	PHYS242 University Physics II		
CS455 Cryptography & Network Security			
** Highly recommended 300-level courses			

<b>MAJOR REQUIREMENTS SPECIALIZATION OUTLINES</b>	
<b>General CS Specialization [28 Credits]:</b> Choose any seven (7) of the general CS elective courses (300 and 400 level) with a minimum of three (3) 400-level course	
<b>Information Systems Specialization [28 Credits]:</b> Choose CS360 and any six (6) of the following courses with a minimum of three (3) 400-level courses: CS320, CS340**, ISCS350, CS355, CS360**, CS375**, CS395, CS420**, CS430, CS440, CS460, CS495, MGT301**	
<b>Software Engineering Specialization [28 Credits]:</b> Choose CS360, CS375, CS440, and any four (4) of the following courses with an overall minimum of three (3) 400-level courses: CS320**, CS340**, ISCS350, CS355**, CS360**, CS375**, CS395, CS410, CS420, CS430, CS440 **, CS455, CS460, CS495, CS496	
<b>System &amp; Networking Specialization [28 Credits]:</b> Choose CS320, CS355, CS455, and any four (4) of the following courses with a minimum of three (3) 400-level courses: CS310, CS320**, CS340, ISCS350, CS355**, CS360**, CS375**, CS395, CS410, CS420, CS440, CS455**, CS460, CS495, CS496, and PHYS242	
<b>Computational Mathematics Specialization [28 Credits]:</b> Choose any seven (7) of the following with a minimum of three (3) Mathematics courses and one (1) 400-level course: CS320**, CS340, CS355**, CS360**, CS375**, CS410, CS430, CS440, CS455, CS460, MATH152, MATH231, MATH225, MATH241, MATH362	
<b>Web Development Specialization [28 Credits]:</b> Choose CS340, CS410/CS420, and any five (5) of the following courses with a minimum of three (3) 400-level courses: CS320, CS340**, ISCS350, CS355, CS360**, CS375**, CS395, CS410, CS420**, CS440, CS455, CS460, CS496, MGT301**	

Figure 2: CS Degree Completion Plan

Year 1 Semester 1		
<b>Major Requirements</b>		<b>12</b>
ISCS140 Programming Foundations I	04	
MATH135 Discrete Mathematics for CS	04	
ISCS150 Website Design & Construction or INCS160 Microcomputer Systems	04	
<b>Integrative Studies Requirements</b>		<b>08</b>
One IQL Course (100-level)	04	
One ITW Course (100-level)	04	
<b>General Electives</b>		<b>00</b>

Year 1 Semester 2		
<b>Major Requirements</b>		<b>12</b>
CS185 Programming Foundations II	04	
ISCS150 Website Design & Construction or INCS160 Microcomputer Systems	04	
MATH151 Calculus or MGT101I Intro to Management	04	
<b>Integrative Studies Requirements</b>		<b>04</b>
One ISP Course (100-200-level)	04	
<b>General Electives</b>		<b>00</b>

Year 2 Semester 1		
<b>Major Requirements (12 – 16 credits)</b>		<b>16</b>
CS265 Computer Architecture	04	
CS280 Data Structures & Algorithms	04	
Second Language (Optional: CS225 or CS310)	04	
MATH152 Calculus II or MGT301 Org. Theory & Behavior	04	
<b>Integrative Studies Requirements</b>		<b>04</b>
One ISP Course (100-200-level)	04	
<b>General Electives</b>		<b>00</b>

Year 2 Semester 2		
<b>Major Requirements (8 – 12 credits)</b>		<b>12</b>
CS215 Operating System Admin	04	
Second Language (Optional: CS205 or CS290)	04	
Any required CS course not previously completed (CS265 or CS280)	04	
<b>Integrative Studies Requirements</b>		<b>08</b>
One ISP Course (100-200-level)	04	
One ISP Course (100-200-level)	04	
<b>General Electives</b>		<b>00</b>

Figure 2: CS Degree Completion Plan (continued)

Year 3 Semester 1		
<b>Major Requirements</b>		<b>12</b>
One CS3xx Upper-level Course	04	
One CS3xx Upper-level Course	04	
One CS3xx Upper-level Course	04	
<b>Integrative Studies Requirements</b>		<b>08</b>
One ISP Course (100-200-level)	04	
One ISP Course (100-200-level)	04	
<b>General Electives</b>		<b>00</b>

Year 3 Semester 2		
<b>Major Requirements</b>		<b>12</b>
One CS3xx Upper-level Course	04	
One CS3xx Upper-level Course	04	
One CS3xx Upper-level Course	04	
<b>Integrative Studies Requirements</b>		<b>08</b>
One ISP Course (300-level)	04	
One ISP Course (300-level)	04	
<b>General Electives</b>		<b>00</b>

Year 4 Semester 1		
<b>Major Requirements</b>		<b>08</b>
One CS4xx Upper-level Course	04	
One CS4xx Upper-level Course	04	
<b>Integrative Studies Requirements</b>		<b>0</b>
None	00	
<b>Electives</b>		<b>08</b>
Elective Course	04	
Elective Course	04	

Year 4 Semester 2		
<b>Major Requirements</b>		<b>08</b>
One CS4xx Upper-level Course	04	
One CS4xx Upper-level Course	04	
<b>Integrative Studies Requirements</b>		<b>0</b>
None	00	
<b>Electives</b>		<b>08</b>
Elective Course	04	
Elective Course	04	

**Note to Students and Prospective Students:** If you are a first-year student starting (or planning to start) your Computer Science education in the fall semester, then this plan will work perfectly for you. If you are a transfer student, or you are starting (or planning to start) in the spring semester, the Computer Science Department will develop an individualized Degree Completion Plan for you to ensure that you complete your degree in a timely manner (assuming that you will successfully complete a full load each semester).

Figure 3: CS Course Schedule Master Plan

<b>Fall Semester</b>	
ISCS140 Programming Foundations I (three sections)	Adj/SB
ISCS150 Website Design & Construction (three sections)	MO/MH
INCS160 Microcomputer Systems (2 sections)	Adj/WL
MATH135 Discrete Mathematics for CS	Math D
MATH151 Calculus I or MGT101 Intro to Management	Math/Mgt D
MATH152 Calculus II or MGT301 Org. Theory & Behavior	Math/Mgt D
CS185 Programming Foundations II	MH
CS225 C++ Programming	MO/EF
CS265 Computer Architecture	WL
CS280 Data Structures & Algorithms	MH
CS310 Systems Programming: C and Assembler	WL
CS360 Database Systems	EF
CS375 Software Engineering	EF
CS395 Mobile Computing	MO/MH
CS410 Advanced Software Development	MH
CS420 E-Commerce Development	CL/MH
CS455 Cryptography & Network Security	WL
CS490 Special Topics	
CS293/493 Supervised Field Experience	
CS294/494 Cooperative Education	
CS498 Independent study	

<b>Spring Semester</b>	
ISCS140 Programming Foundations I (three sections)	Adj/SB
CS150 Website Design & Construction (three sections)	MO/MH
INCS160 Microcomputer Systems (2 sections)	Adj/WL
MATH135 Discrete Mathematics for CS	Math D
MATH151 Calculus I or MGT101 Intro to Management	Math/Mgt D
MATH152 Calculus II or MGT301 Org. Theory & Behavior	Math/Mgt D
CS185 Programming Foundations II (two sections)	MH
CS205 User Interface & Visual Programming	MO/EF
CS215 Operating System Administration	CW/WL
CS265 Computer Architecture	Adj/WL
CS280 Data Structures & Algorithms	EF
CS320 Operating Systems Design	WL
CS340 Internet Programming	MH
ISCS350 Systems Analysis & Project Management	SC/EF
CS355 Computer Networks	WL
CS430 Principles of Programming Languages	MO/EF
CS440 Software Engineering Project	EF
CS460 Data Warehousing & Advanced SQL	RF/EF
CS496 Games Programming	Adj/EF
CS495 Artificial Intelligence & Robotics	WL
CS293/493 Supervised Field Experience	
CS294/494 Cooperative Education	
CS498 Independent study	

## H. Mentoring Initiative

The CS Department provides a Mentoring Initiative for students who are interested. The purpose of the CS Mentoring initiative is to provide focused and intentional grooming for CS majors on their journey to becoming outstanding CS professionals. Students participating in this initiative will be guided on matters relating to the following:

- Career direction
- Choice of CS electives
- Choice of specialization
- Choice of minor or second major
- Preparation for graduate school
- Preparation for the workplace

There are two components of the mentoring initiative: one is faculty-guided and the other is student-driven. Both components are student-centric, i.e., the entire motivation initiative is geared toward student success. Sections H1 – H3 below are related to our faculty-guided mentoring and section H4 relates to our student-driven mentoring.

### H1. Admission (Opt-in) and Exit (Opt-out) Requirements

The CS Mentoring Initiative is optional for students. Students are admitted to the mentoring initiative through mutual agreement between the student and the mentor. The mentor may favor certain criteria such as:

- Minimum required GPA
- Well-disciplined and focused attitude to CS education
- Exemplary manners and decorum among students and toward faculty members
- Sound critical thinking disposition

The student may also be looking for certain criteria in the prospective mentor such as:

- Mastery of the areas of CS that the student is interested in
- Good rapport with the student
- Confidence in the faculty member's methods of communication and teaching

If there are dissatisfactions with the mentoring relationship, a student may opt to leave a mentoring cohort via any of the following means:

- Mutual agreement between the student (mentee) and the faculty member (mentor)
- Independent decision of the student (mentee)
- At the advice of the faculty member (mentor)

## H2. Mentoring Activities

A mentoring relationship is a very special and close relationship in which you will be groomed into an exemplary CS professional.

- Students will be invited to participate in two major activities each semester — one at the beginning and another toward the end. Such activities may include (but are not confined to) software engineering summit, CS conference, networking summit, database systems summit, etc.
- The mentor may add participating students to a mentor's CS Mentoring Mailing List. This means that on a periodic basis the mentor may forward students various articles and discussions on contemporary developments in CS. Occasionally the mentor may invite the students to meet and discuss some of these issues.
- Since CS students participating in the mentorship initiative are expected to be exemplary students, it is expected that they will support the CS Club, UPE, and other departmental activities.

## H3. Continuity after KSC

The mentoring relationship continues after your education at KSC, until it is clear that you no longer need the initiative. The ultimate goal is to help students become successful CS professionals. Often, this requires more than a first degree in CS.

## H4. Student-Driven Mentoring

The idea of student-driven (peer) mentoring is for upper-division CS students who have excelled in earlier CS courses to participate in catalyzing and enriching the learning of other students who are pursuing lower-level CS courses. The CS Peer Mentoring/Tutoring Initiative (CS-PMI) refines the longstanding departmental practice of offering peer-based tutoring for lower-level CS courses and using this engagement to fulfill the requirements of CS293/CS493 Supervised Field Experience. The essential features of this initiative are:

- CS majors with an average grade of AB in their CS courses (preferred minimum GPA of 3.4) are invited to be student mentors.
- First and second year CS majors are placed in cohorts of three or four individuals.
- Each cohort will be assigned a student mentor.
- Student mentors participate in mandatory initial training before assuming their responsibilities. Each student mentor will work closely with entry-level students in his/her assigned cohort to ensure that they are making good progress in learning the discipline of CS. Activities would typically include tutorials geared towards successful completion of reading assignments as well as written assignments, and answering any course-related questions that these students may have. The minimum recommended hours per week is 3 hours, including a minimum of 25 minutes one-to-one meeting with each protégé per week.
- Student mentors shall work closely with course instructors and may attend classes as required to ensure that they are reinforcing materials covered by course instructors.
- Student mentors who have not yet completed the course CS293/CS493 may be awarded credit for such courses provided that they meet all the course requirements as specified by the related CS course instructor. Student mentors who have already completed the course CS293/CS493 may still continue as mentors as a service to the CS Department, and have the option of also collaborating with the Aspire Program or the BEST (Building Excellence in Science and Technology) Initiative.
- Student mentors will maintain a journal of their mentoring activities. At the end of each semester of operation, each student mentor will submit the Department Chair or CS faculty member duly assigned, the Journal of their Mentoring Activities, as well as a Reflective Paper (maximum 5 pages) on how their mentoring went.
- Student mentors may be constructively evaluated by the Department Chair or CS faculty member duly assigned, based on feedback from the protégés in their respective cohorts as well as other verifiable facts, as to the effectiveness of their mentoring activities.

Student mentors are required to be academically strong and exhibiting exemplary conduct; otherwise, they may not participate as mentors.

## **I. Concluding Remarks**

This guide has touched on salient matters that you need to be aware of as you pursue your CS education here at KSC: your responsibilities; the responsibilities and commitment of the CS faculty members and Department Chair; declaring your major and obtaining career advice; internship and/or study-abroad opportunities; selecting your CS courses; and an optional mentoring initiative that you may participate in. Be sure to refer to this document as often as you need to.

If you have additional questions or concerns, be sure to contact your academic advisor or the Department Chair. We are all here to make your experience studying Computer Science a meaningful and worthwhile one.

Below is the contact list for the full-time faculty members. However, we are also supported by a rich cadre of committed adjunct professors, and are fortunate to have the industry experience that they bring.

### **Contact List**

Dr. Elvis Foster ([efoster@keene.edu](mailto:efoster@keene.edu)), Chair

Dr. Shari Bemis ([sbemis@keene.edu](mailto:sbemis@keene.edu))

Dr. Michael Hanrahan ([mhanraha@keene.edu](mailto:mhanraha@keene.edu))

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