Team: <anonymized>
Project: Design of the student UI with respect to scheduling classes at OSU.

RESEARCH & INSIGHTS

Research Questions/Goals

The goal of our research was to gain retrospective input/insight into the user experience of the current tool/process used by EECS students to do their academic class schedule planning. We limited our research to a retrospective perspective given the EECS students and advisors have already gone through the scheduling process for the academic year. We used a semi-structured approach due to the fact that it would provide some structure and consistency between the interviews conducted but also allowed for some flexibility and additional insights. We wanted to ensure we got the perspective from both an ECE student and a CS student. We also thought it would be beneficial to get the input of an advisor as they are the recipients of the schedules students plan and must go through each one checking for correctness.

The base questions used for the structure of the interviews:

- How much time do students take to plan their schedule?
- Would they really plan out all four years at once?
- How do users feel about planning all four years?□
- How often would students update their plans?
- Computer skills of users?
- What other possible users are there?
- Are there any privacy issues or concerns?
- What are the most common mistakes that student's make with regards to scheduling?
- Do users remember what classes they were previously taking with respect to their transcripts?

Process For Answering Questions: How did you proceed to answer these questions? Be detailed. For example, if you conducted an interview, list all the questions. Where and when did you collect the data? How did you set up to allow triangulation, etc.

The process we used to answer our questions was to perform field interviews and one observation was performed. Those interviewed were an ECE student, a CS student and an EECS advisor. The ECE student was observed while filling out one of the academic planning schedules.

The student interviews were conducted in public settings (ECE student KEC atrium in public setting / CS student in Dearborn lab). The advisor interview was conducted in the advisor's office. All interviews were conducted during the day.

We allowed for triangulation by asking similar questions to the interviewees and determining if we received similar answers from them. We saw more triangulation amongst the student interviewees as was expected since they perform the same role. However some questions did allow for triangulation amongst all three respondents, an example being thoughts regarding a four year plan.

The specific interview questions that were asked are listed below along with the interviewees' responses.

Exhaustive inventory of the four elements that are in place: (additional details contained in interview/response section)

- Only one student filled out the actual form and was observed.
- Mostly 1:1 conversational based interaction.
- Student interviews were conducted in public space which actually allowed the conversation to be more relaxed/free.
- Excel spreadsheet. Computer available to look at course catalog (not used). Pen to mark form.

The people in the space

 Who are they? What are they doing? How are they doing it?

- Student interviews: interviewer (student) and interviewee (student), other students/people around (public setting) – they are talking, working on homework/projects, relaxed atmosphere
- Advisor interview: Just interviewer (student) and interviewee (advisor)

The objects in the space

 What are the functional elements?

- ECE student: wood tables & chairs, computer, print out of the Excel ECE advising spreadsheet, two personal spreadsheets the interviewee uses to track their courses (copies provided with this document), pen
- CS student: only interview conducted, so there was no observed interaction with functional elements, computer lab setting
- Advisor: desk, office chair, computer

 What are the decorational elements?

- ECE student: KEC atrium décor
- CS student: Dearborn computer lab décor, not much decoration
- Advisor: There are many pictures of his kids and a lot of Disney memorabilia decorating his office.

Which do people interact with or look for?

- ECE student: print out of the Excel ECE advising spreadsheet, two personal spreadsheets the interviewee uses to track their courses, pen, computer available but did not utilize
- CS student: Only an interview was conducted so there was no observation of interaction with objects.
- Advisor: Used the computer to bring up the current academic planning spreadsheet which was used as a reference and to point out certain aspects of the design.

The building: spaces, architecture, lighting etc

What is the layout? What is the environment like? How does it influence the activities people engage in?

- ECE student: KEC atrium – open layout, lunch tables and chairs, contemporary architecture, a lot of natural lighting due to large windows, influences people to: study/collaborate together, to converse with each other, to eat/drink freely
- CS student: computer lab – multiple rows of computers on desks, older architecture, fluorescent lighting, influences people to study/work on the computer
- Advisor: office layout, office desk with computer on it, office chair, bookshelves, chairs for visitors, environment is professional with some personal touches (pictures, Disney memorabilia), very organized, influences people to do their work activities and hold focused conversations

How does the building support the objects above?

- KEC supports the objects we listed above by providing the space and infrastructure required. An example being wireless capability for the computer that was available to the ECE interviewee during the observation.

The technology

What `technology' is here (not just computer technology)? How do people interact with it? How does it fit in with, or support the users activities? How does it fit in with the environment?

- For the observation conducted on the ECE student, the technology available to the interviewee was a laptop that had access to the OSU course catalog via a wireless connection. However, the interviewee did not choose to use the laptop as she already had a good idea of how to complete her academic plan. This would not be the case for the all students. Some students would need to look up courses in the course catalog and the KEC atrium environment would allow for this by enabling students to use connect to the course catalog wirelessly via their laptops.

Detailed observations & interview responses (verbal and non-verbal)

CS Student – M1

The interviewee was a Junior standing Computer Science major on the Computer Systems track of the major. He is currently in pro school and taking upper division courses. He did not elect to enter MECOP.

How many times have you filled out an (eecs) academic plan?, About how much time do they take you to fill out?

M1 said he had filled out 3 plans, which each took about 2 hours.

What is the most time consuming part of filling out the plan?

He said that looking up the courses in the course catalog was the most time consuming part of the process. M1 actually looks up not just what term courses were being offered, but the expected times they were to be offered and created a little schedule of courses for each term. By making the schedule, he can be sure his plan doesn't have any time conflicts in terms of course offerings.

Do you find anything ambiguous about the plans?

He said no here, but his body language was fairly hesitant. I am not sure if this was due to him wanting to say yes to a related question (he would later bring up that he found keeping track of requirements for courses confusing – which isn't too unrelated) or if he was just trying to think about the question. To this point in the interview, questions had been pretty objective in nature, so it was somewhat of a switch.

How do you feel about finishing the plans, when you're done?

M1's response here was a bit confused at first, which is probably appropriate. This question really doesn't do a good job of getting what I want to, which is to ask if they feel the academic plan provides them any benefit other than having the organization done.

I told this to M1 in response to his confusion, and his response was that it gave him some relief to know he had things organized in terms of what he needed to be taking and having an idea of how long getting his degree would take.

Do you end up following your plan exactly? Why have you had to make those changes?

M1 has not followed the plans he has made exactly. He gave three major reasons he has had to change the plan in any given term. The first is that he has had some health concerns, and that has caused him to scale back on his work load in some instances. Work load also came up as another reason he would stray from his plan. Some terms he simply felt he had too much to do, and ended up dropping a course rather than get overwhelmed.

The final reason M1 mentioned for deviating from the academic plans he spent so much time filling out is due to unexpected course offerings. While the academic plan makes a good record of when required classes will be available, it doesn't say much about the computer science electives. There is information on these electives listed on the course catalog, but it isn't always clear what the requirements for some of the classes are, and sometimes the availabilities change. So when a course he is more interested in than an elective he had put on his academic plan becomes available, M1 has been willing to change his plan to pursue that interest.

Is there anything you've thought of off hand that you'd like to change about the plans?

To me, the response to this question was the most interesting of the interview. Like the ambiguity question, M1's body language made it clear to me he wasn't sure how to approach it. When he knows what to talk about, M1 makes very good eye contact, he gestures, he jokes. When trying to answer this question, M1 was tense and looking off into the distance.

Seeing his discomfort, I tried to explain what I wanted out of this question – again like the ambiguity question. My hope in asking this was just to allow the interviewee to bring up a topic about the plan that had not been covered by the questions before.

After the explanation M1 thought for a moment, and said he would like it if the academic plans were archived on the COE TEACH website. He wanted a place where the most recent academic plan he completed would be, securely, in case he lost the file or the hard copy he had for whatever reason, rather than having to go into the EECS office in Kelly to ask to look at his plan.

He also mentioned that he felt it was a little bit much that he had already filled out

so many plans, though he did think it was a good use of time.

It was in this last point, about how the academic plans being a good use of time, that M1 made reference to time he'd spent at another University. While I had talked to him a little bit about this before, it was something that in terms of this interview had completely slipped my mind. At this point, the interview shifted to asking him questions about his experiences at this other University, with the big emphasis being on how the registration processes were different.

So what was the other University that you attended? What was the means of registering for classes?

M1 transferred last Winter, for a term, to the University of Santa Cruz. He was enrolled in a (fairly new) game design program they had. He said the registration process wasn't too different from here. They still had a (online) course catalog where much of the information on courses was to be found. However, rather than just searching for classes by major and adding them from a flat list, he said they displayed the courses like a calendar "kinda like Google Calendar... except it wasn't Google Calendar". From here you put courses from the registration calendar into your schedule. Your schedule was also displayed in the same fashion. Here, he mentioned that it wasn't all that different from the 'view schedule by day and time' option we have through infosu.

What was the advising process like there?

While M1's experiences with registering for classes were a little different from here, overall they weren't that different. The advising process was a different story. The first word he used to describe what it was like at Santa Cruz was "terrible".

He never had to develop a long term plan, either before or during his time there. He said, even after transferring, he was still registering for classes for that term. The only way to receive advice on advising was a face to face meeting with an adviser, which he described as being very 'ad-hoc'. He said they advisers were usually unsure of what all was required of the program, and had a tendency to make mistakes.

The experience on a whole, as he described it, seemed disorganized and frustrating. While M1 was engaged for most of the interview before we started talking about his time at UC Santa Cruz, the discussion of his time there really elevated things to another level. His voice was passionate when he spoke, his gestures grander, and more violent. I think it would have been pretty obvious to anyone watching us that M1 was not happy when talking about this.

There was one thing though, that M1 said he really liked about Advising at Santa Cruz. He said they had a sheet that had all the classes required to graduate,

organized in a 'very visual' manner to help show course dependencies. He expressed that this was much clearer for him to follow and make sense of then the academic plans we have now, in terms of understanding which classes have what requirements.

While he didn't describe it in detail, he said this sheet was organized so that courses at the top of the page had no requirements (or the least) while courses at the bottom had the most. Courses could be arranged at different positions horizontally, implying that they required the same courses, or the same amount of prerequisites to be able to take.

When talking about this sheet, M1's body language once again changed. Gone was the tension and severity he had when talking about the advising process. What took its place was an almost wistfulness. He was much more muted in both tone of voice and volume, and his body language. It seemed like he was genuinely disappointed that OSU didn't offer something like this for him.

ECE Student Interview – F1

I set up the interview in the atrium of Kelley Engineering Center at one of the lunch tables. The student that I decided to interview was a woman (F1) who was majoring in Electrical Computer Engineering. She and I were surrounded by other students who either listened into our conversation or kept to their own devices. After introducing myself and outlining how the interview who would work, I placed a sheet of paper in front of her. This paper is most known as the ECE advising spreadsheet. I asked her to fill out the spreadsheet with respect to the classes that she will take in the next couple of years, using whatever means possible. This included using the laptop that I provided sitting in front of her, which she could use as a reference. While she completed the task, I noticed the following:

- She filled out her name in the appropriate field
- She filled out her ID in the necessary field
- placed "x" in the done column as opposed to numbers
    - Later explained that X's are faster, because numbers are in the descriptions
- Talks through filling out the form, but barely. This included the phrases:
    - "Wait, I have already done that class..."
    - "Oh, I should take it this term"
- She does not use the computer as a reference
- Has memorized what she needs to take.
    - Knows ahead of time what she needs to take
- Has extra curricular, but did not feel that she had to fill out the columns for that

After finishing the task, I began to ask F1 about the scheduling process. Beneath each question is her response, followed by my (Kevin) notes about general observations.

Do you believe that the scheduling process is for the student or advisor?

Begin F1 response:

- I believe it is for me
- I have three different methods for keeping track of the process
  - Excel spreadsheet which outlines:
    - Quarter
    - Credit
    - Grade
    - Name
    - Term Offered
  - Chart which outlines the next two years
    - Fall, Winter, Spring
      - Courses that will take
    - What is required for track
    - On this chart, the courses written in blue have already been taken, while the courses in pencil still have yet to be taken.
  - ECE Spreadsheet.

End F1 response

Kevin: These spreadsheets were made available to us. They seem to mock the current scheduling spreadsheets, but from her perspective, they makes it easier for her to understand.

Why do the three methods for scheduling classes?

"Different ways to plan to the end."

How much time do students take to plan their schedule?

"[Initially] during the summer, I was considering doing research or double majoring; [I] had many charts planned out. This is because I was considering different tracks. I was looking at different tracks because I was not sure what I wanted to do."

Kevin: Currently she does little updates here and there with her advisor. Nothing as intense as when she was initially planning here schedule out.

Would they really plan out all four years at once?

"Three years before I started here, I had four years planned out."

How often would students update their plans?

"Any time that I make changes to my classes, but essentially [I only make changes to my schedule when] I update my grades. I find it is a good way to keep track of my GPA."

When I look for my final grades?

"Unofficial transcript, mostly because everything is there."

Computer skills of users?

"I started in CS 161. Competent, but not with programming"

Kevin: She was a little baffled by this question. I think it is safe to say that she uses a computer enough to schedule classes.

Are there any privacy issues or concerns?

"I share grades socially every now and then, but I only share my grades with advisor. I got what I got, but I have found that I can be embarrassed too."

Meeting with Tyler?

"I meet with Tyler twice a term, as he can answer my questions."

What are those questions?

"Special cases, such as ROTC. Certain questions that I ask are: How can I make sure that I don't go another year? How can I make sure to to keep my credit load down?"

How hard is it to combine ROTC and ECE?

"Scheduling is easy, they are only an hour a week. However, ROTC is very flexible."

Kevin: She seemed proud of her ROTC background and courses that she takes.

What are the most common mistakes that student's make with regards to scheduling?

"I find that track specific courses were slightly confusing. Transferring between my information and the excel spreadsheet has usually had some errors show up. However, because of my constant meetings with Tyler, I had few mistakes."

Do users remember what classes they were previously taking with respect to their transcripts?

Kevin: Did not have to answer this question because it was easily derivable. She uses her unofficial transcript as a means of identifying final grades and actually has them memorized as illustrated by when she filled out the transcript in the observation portion of this study.

Overall comments/observations:

F1 was very calm and relaxed when it came to her answering questions. Other emotions that I did not mention (i.e. confusion) were due to my phrasing of some questions.

EECS Advisor Interview – A1

The interview was conducted in A1's office. Only A1 and I were present and he was sitting at his desk like he usually does during advising sessions with his computer in front of him. There are many pictures of his kids and a lot of Disney memorabilia decorating his office. It is very organized with a bookshelf containing advising aides (course catalogs, etc) in chronological order and a clean desk with a computer on it. During the interview A1 brought up the current academic planning spreadsheet on his computer to use as a reference and to point out certain aspects of the design. He was able to use it as a tool to help him answer some of the questions I gave him. He seemed very comfortable in this environment and did not exhibit any signs of uncertainty or unrest.

How many years have you been an adviser?

Officially 3 in June. About 5 years total at the school.

How many students do you advise per term?

Over 1k in CS program at anytime. Usually about 150 -200 students assigned to A1.

Do you have to review academic plans for each student you advise?

Yes

(If yes) How long does it take to review them? For the students to correct mistakes and resubmit?

Pretty quick at it now. About 10 minutes per one. Usually don't let students leave if it needs fixing. If the student does leave before fixing sometimes don't get them

back till next term. But some bring back same day, depends on student

What are the most common mistakes that students make when planning their schedules?

Prerequisites mixed up. Students also mess up their track courses. Have courses that aren't in their track, or offered at the wrong time.

How often do students update their academic plan?

Once a year is required. Lots of students update throughout the year though.

Would having a 4 year plan be better than having a 2 year plan? Why? Why not?

4 year plan will never be consistent. 2 years is hard enough to stick to. 4 years takes a long time and will almost always change. Some international students do 4 year plans though. 2 year plans seem to work out the best.

How often are classes changed/added? Academic plan updated each time?

Throughout the year courses are added. Not always matching up with the website. Emails are sent out when new courses are added so students know. Updates about once a term, right around priority registration. If course is pulled, mass email is sent out. If it impacts your academic plan, students need to update their plan and see adviser.

Does this have a big effect on academic planning?

Depends on change. See above

What elements about the current academic planning spreadsheet do you like? Why?

Planning aspect. If students utilize it, it makes advisers job a lot easier. Advisers can focus on non planning issues (MECOP. Grad school, etc).

What elements about the current academic planning spreadsheet do you dislike? Why?

If there are changes made to the plan, the students copy is not updated since it is a local copy.

Is there anything that you would change to make it easier on the advisers?

When the student selected a Track, if it filled in the required courses that would

be nice.

What would you estimate the computer skills of advisers to be on a scale from 1-5 with 1 being very low and 5 being very high?

4-5. 5 for most CS advisers. Everyone else at least a 4

Are there privacy concerns that go along with academic planning?

ID numbers are on them. When they pick up their plan in the fall, must show ID. FURPA (sp?) guidelines. Student ID and schedule confidential, future planning not quite as confidential.

Other comments by A1:

Not a lot of big changes over the last few years. So it was initially a good form. Big issue is looking through each and every one to make sure it doesn't contain mistakes, very time consuming. Academic planning is done in the Fall since it is so time consuming. This way it avoids conflicts with other important deadlines such as applying to grad school.

Results: What are the answers to your research questions?

How much time do students take to plan their schedule?

Completing the EECS academic scheduler does take time and thought to complete. It is not something that someone can just brush off or just throw together at the last minute.

Advisors can spend a minimum of 25-33 hours (this is the low end) is the time reviewing and correcting academic plans.

Would they really plan out all four years at once?

Some students already do plan four years using their own offline spreadsheets.

How do users feel about planning all four years?

4 year planning can be difficult and cause much rework since specialty classes are only scheduled out two years in advance. Course schedules can also be added or canceled throughout the academic year causing students to have to adjust their plan. Planning 2 years can be difficult enough.

How often would students update their plans?

Some students update their plans throughout the year and meet with their advisor regularly to get input/assistance.

Computer skills of users?

Computer skills of users are on the high range. On a range of 1 -5, users (advisors and students) probably range from 4 – 5.5.

What other possible users are there?

None identified at this time.

Are there any privacy issues or concerns?

Privacy is paramount. Student IDs and schedules are confidential. There are FURPA (sp?) guidelines that must be met.

What are the most common mistakes that student's make with regards to scheduling?

- The Track area is prone to mistakes. Some students put down classes that are not even a part of their track or aren't scheduled for the term the student plans to take it.
- Prerequisites can also cause mix-ups. Students often schedule the prerequisites out of order.
- Students don't use the conventions requested. They use x's vs numbers when marking their planned courses.
- Students don't feel they need to fill out the "Other" area of the form and just leave it blank.

Do users remember what classes they were previously taking with respect to their transcripts?

Users have to look up previous classes from their transcripts.
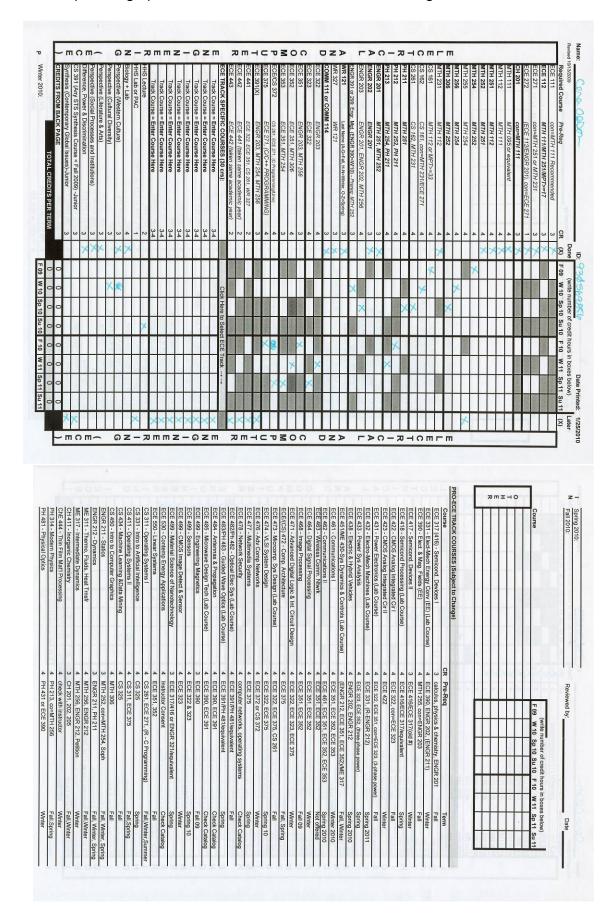

Insights: What other insights did you get from this that is relevant to your design?

Based on our research we've identified the following insights:

- Advising for classes is separate from scheduling classes.
- Advising is paramount in deciding course plans and avoiding problems/mistakes – example: advisors highlighting prerequisites and co-requisites required.

- Students who meet with their advisors regularly seem to have fewer problems in filling out their plan. This leads us to believe including some sort of hints and/or tips in our user interface will help students as they do their planning. The same sort of tips an advisor would provide.
- Advising is for the whole college but the advisors often need to focus more on juniors and seniors. One of the reasons is that seniors and juniors have more choices in the courses they take thus there is more conflict.
- Planning out farther than two years could prove to be difficult or cause a lot of rework as specialty classes are only planned two years in advance and courses can be added or canceled throughout the year. Some students do like to plan four years despite that though.
- Students appreciate different ways of scheduling classes.
- The majority of advising begins at beginning at of academic year. This is intentional to avoid conflicts with other deliverables (graduation, etc.)
- Students care more about the course being marked complete than the actual grade – for this planning process.
- Students maintain/change their plan throughout the year. Not just once per year as is the minimum requirement.
- The Track section is a common problem area on the current excel tool. It would be nice to auto-fill track area with available courses once a student picks his/her Track. Students often just check the "Later" box in the section to avoid filling it out.
- There needs to be a method to incorporate double majors and/or minors from outside the EECS department and to incorporate those courses. Example: MECOP student would have blank terms.
- Course descriptions needed to be readily available.
- Need to accommodate for people who are over 4 years.
- Need to be able to save academic plans and easily retrieve them (student and advisor).

Academic planning spreadsheet ECE student filled out during observation:

Sample of personal document ECE student uses to plan/track courses:

old

Summer		Fall		Winter		Spring	
Course	Credit	Course	Credit	Course	Credit	Course	Credit
Year: 2008-2009							
CH223	5	BI211	4	MTH 231	4	ENGR202	3
		MTH251	4	MTH 252	4	MTH254	4 (D)
		ECE 111	3	ECE 112	3	ECE271	3
				ENGR201	3	ECE272	1
						comm 111	3
Total:	5	Total:	11	Total:	14	Total:	14
Year: 2009-2010							
WR 327	3	CS161	4	CS 162	4	CS261	4
		PH 211	4	ANTH 330	4	PH 217	4
		MTH 254	4	MTH 256	4	ENGR203	3
		MS130	1	EWR 390	3	MTH 306	4
		AFROTC	3	AFROTC	3	MS 130	1
				MS 130	1	AFROTC	3
Total:	3	Total:	16	Total:	19	Total:	19
Year: 2010-2011		APPLY FOR PROSCHOOL					
HHS231	2	ECE 351	3	ECE 352	4	ECE353	3
		ECE 375	4	ECE 391	3	ECE 323	4
		PH 212	4	PH 213	4	ECE 372	4
AS 304	6	CS 391	3	ECE 322	4	MTH 255	4
		AFROTC	4	AFROTC	4	AFROTC	4
		MS130	1	MS130	1	MS130	1
Total:	12	Total:	19	Total:	20	Total:	20
Year: 2011-2012							
HHS431	2	ECE 468	4	ECE 464	4	ECE 499	4
PDT		ECE 461	4	ECE 462	4	ECE 443	2
		CS 450	4	ECE 476	4	HST 485	3
		ECE 441	2	ECE 442	2	ECE 478	4
		AFROTC	4	AFROTC	4	AFROTC	4
		MS 130	1	MS130	1	MS130	1
Total:		Total:	19	Total:	19	Total:	19
Year: 2012-2013						PAC	1
				BACC CORE			
		✓ CS450		✓ CS 391			
				✓ HST 485			
				✓ HHS231			
				✓ PAC 1			
Total:		Total:		Total:		Total:	

Sample of personal document ECE student uses to plan/track courses:

Bachelor's of Science: Electrical and Computer Engineering
-Systems, Signals, and Communications Track-

Electrical and Computer Engineering Courses

Course	Cr	Course Title	Prerequisites	Quarter	Taken
ECE 111	3	Introduction to ECE: Tools	None	F	F 08
ECE 112	3	Introduction to ECE: Concepts	None	W	W 09
ECE 271	3	Digital Logic Design	Math 251*	F/Sp	Sp 09
ECE 272	1	Digital Logic Design Lab	ECE 271*	F/Sp	Sp 09
ECE 322	4	Electronics I	ENGR 203	W	
ECE 323	4	Electronics II	ECE 322	F/Sp	
ECE 351	3	Signals and Systems I	ENGR 203/MTH 255	F/W	
ECE 352	4	Signals and Systems II	ECE 351/MTH 306	W/Sp	
ECE 353	3	Intro to Prob and Rand Signals	ECE 351/MTH 254	W/Sp	
ECE 372	4	Intro to Computer Networks	CS 261/CS 271 or ECE 375	All	
ECE 375	4	Computer Org & Assembly	ECE 371/CS 261	F/W	
ECE 391	4	Transmission Lines	ENGR 203/MTH 254/256	W	
ECE 441	2	Senior Design Project	ECE 322/351/375	F	
ECE 442	2	Senior Design Project	ECE 441	W	
ECE 443	2	Senior Design Project	ECE 442	Sp	

Engineering Courses

ENGR 201	3	Electrical Fundamentals I	MTH 251/252	All	W 09
ENGR 202	3	Electrical Fundamentals II	ENGR 201	W/Sp	Sp 09
ENGR 203	3	Electrical Fundamentals III	ENGR 202/MTH 256	F/Sp	
ENGR 390	3	Engineering Economy	Soph Standing	F/W/Sp	W 10

Computer Science Courses

CS 161	4	Computer Science I	MTH 231*	All	F 09
CS 162	4	Computer Science II	MTH 231/CS 161	All	W 10
CS 261	4	Data Structures	CS 162	All	
CS 391	3	CS Ethics	None	F/W/Sp	

Mathematics Courses

MTH 231	4	Discrete Math	MTH 112	F/W/Sp	W 09
MTH 251	4	Differential Calculus	MTH 112	All	F 08
MTH 252	4	Integral Calculus	MTH 251	All	W 09
MTH 254	4	Vector Calculus I	MTH 252	All	F 09
MTH 255	4	Vector Calculus II	MTH 254	All	
MTH 256	4	Applied Differential Equations	MTH 254	All	
MTH 306	4	Matrix & Power Series Methods	MTH 252	All	W 10

Physics Courses

PH 211	4	General Physics with Calculus I	MTH 251	F/Sp	
PH 212	4	General Physics with Calculus II	MTH 252/PH 211	W/F	
PH 213	4	General Physics with Calculus III	MTH 254/PH 212	Sp/W	

Chemistry Course

			Done		
CH 201	3	General Chemistry	--		Transfer

Track Specific Courses
-Systems, Signals, and Communications-

Required

ECE 464	4	Digital Signal Processing	ECE 351/352	W	
ECE 468	4	Image Processing	ECE 351/352	F	
ECE 461	4	Communications I	ECE 351/352/353	F	
ECE 462	4	Communications II	ECE 461/351/352/353	W	

Restricted Electives

CS 450	4	Intro to Computer Graphics	MTH 306	F	
ECE 476	4	Adv Computer Networks	ECE 372 or CS 372	W	
ECE 478	4	Network Security	Comp Networks/ Operating System	F	
ECE 499	4	Special Topics/Sensors	ECE 322/323	Sp	

*Can Be Taken Concurrently
'Required to Enter Pro School
-Prerequisite Only

Baccalaureate Core
WR 121 (3) - **Transfer**
Writing II (3) - **Transfer**
Writing III/Speech (3) - **Su 09**
HHS Lecture + 1 cr Lab
Biological Science + Lab – **Fall 08**
Western Culture (WC) - **Transfer**
Cultural Division (CD) – **W 10**
Difference, Power, and Discrimination (DPD, 3) - **Transfer**
Social Processes and Institutions (SPI, 3) - **Transfer**
Contemporary Global Issues (GII)
Literature and Arts (LA) - **Transfer**
Science, technology, and Society (ST) - **CS 391**
Foreign Language - **Transfer**