

Bachelor of Science in

# Information Technology

# Student Handbook



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**Information Sciences and Technologies**

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## Expectations for Our Students

Our expectations fall into two general categories, effort and ethics. We'll start with **effort**. To graduate from the IT program, you'll work hard, both in and outside of class. The rule of thumb at RIT is that for each credit hour of a course, you can expect to work an average of three to four additional hours on that course outside of class *per week*. For a four-credit course, then, you can expect to work 12 to 16 hours outside of class per week just on that course. If you multiply that by four classes, which is the standard load, you get numbers like 48 to 64 hours per week. If that sounds like a full-time job, that's because it is a full-time job. This is what it means to be a full-time student!

To be sure, some of your courses will take less time than the average, but some will take more. Three to four hours per credit hour per week is the average. This is very different from high school, where the numbers are in the opposite direction. In high school, you typically spend less time on homework than you spend in class. In college, learning is primarily the student's responsibility; lectures, labs and active learning classes are resources, but they are only the tip of the iceberg. To get the most out of your lectures, labs and active learning classes, you need to prepare for them. That means you need to do the assigned readings, homework, research, or practice exercises before the classes or labs, because the course instructor will assume you have done that work. Going into a class unprepared is not a productive use of that resource. Going into an exam or a lab practical unprepared is a good way to fail a course.

The **ethics** expectation is equally important. Professional ethics are important in all fields but are especially so in IT. IT professionals are entrusted with an enterprise's most important asset – its information. IT professionals must have strong ethical values, and they must behave ethically at all times. In these times of rapid societal change, brought about largely by the technology we deploy, we simply must do the right thing. This depends on two things, knowing what the right thing to do is, and having the personal integrity to do it. You will find that ethics is a topic in most of our courses, so you certainly will have ample opportunity to learn what ethical behavior is. Having the integrity to behave ethically ultimately falls on your shoulders.

In an academic setting there is a special ethical issue that is vitally important: **academic honesty**. “As a university, RIT is committed to the pursuit of knowledge and the free exchange of ideas. In such an intellectual climate it is fundamentally imperative that all members of this academic community behave in the highest ethical fashion possible in the manner by which they produce, share, and exchange this information. In the case of students, Academic Honesty demands that at all times student work be the work of that individual student, and that any information which a student uses in a work submitted for evaluation be properly documented. Any violation of these basic standards constitutes a breach of Academic Honesty and hence becomes Academic Dishonesty.” A finding of academic dishonesty against a student can have serious consequences. At this time, please review the remainder of RIT's Academic Honesty Policy at [http://www.rit.edu/studentaffairs/studentconduct/rr\\_academicdishonesty.php](http://www.rit.edu/studentaffairs/studentconduct/rr_academicdishonesty.php).

## The Program

### **Requirements**

To graduate with a BS in Information Technology, you must complete 181 credit hours. For entering first-year students, you will earn most (if not all) of those credits here at RIT. For transfer students, some of those credits will be transferred into RIT from your previous school(s). RIT is currently on a *quarter system*, which means that we have four academic quarters per year: Fall, Winter, Spring, and Summer. The school year “begins” in Fall, although you can take courses year-round if you wish. There are fewer choices for classes in the Summer Quarter. The 181 credits that you need to graduate are broken down as follows:

- 76 credits of Information Technology (52 credits core, 24 credits concentration)
- 36 credits of Liberal Arts
- 26 credits of Math and Science
- 16 credits of General Education Electives
- 24 credits of Free Electives
- 3 credits of Seminars

### **Information Technology Courses (76 credits)**

The Information Technology Courses are of two types: required core courses and the Information Technology concentrations. The core lays a foundation in the five IT pillars (course numbers included; see course descriptions at the end of the handbook):

- Programming and application development (4002-217, 218, 219)
- Web and multimedia development (4002-320, 331)
- Database (4002-360)
- Hardware and Networking (4050-220, 350, 351)
- User-Centered Design and Deployment (4002-425, 426, 455, 460)

The first four pillars represent technical areas that are front-loaded into the first two years of the curriculum to equip you with the technical skills necessary for your first co-op experience, which ideally will occur during the summer after the second year. Three of the four user-centered deployment courses require co-op as a prerequisite to insure that students have an adequate perspective on the field, which places these courses in the third or fourth years.

In addition to 52 credits of core courses, you will select two 12-credit concentration areas of advanced study (total of 24 credits). These concentrations represent advanced specializations in information technology and are selected by you and approved by your Academic Advisor. Since many advanced courses are offered only once or twice a year, you should plan your co-op blocks so that you will be on campus when the courses in your chosen concentrations are offered.

Current concentration areas include:

- Web Development
- Database
- Web-Database Integration Track (six courses, both concentrations)
- Advanced Application Development
- Learning and Performance Technology
- Medical Informatics
- Networking and System Administration
- Geospatial Informatics
- Special Topics

### **Math and Science Courses (26 credits)**

This required block consists of courses offered by the College of Science. You need to take Discrete Mathematics for Technologists I and II, and two statistics course (Data Analysis I and II). Two lab science electives (such as Physics, Chemistry, Biology, Astronomy, or Imaging Science) are also required.

The two Lab Science Electives can be any courses from the College of Science that include a lab component. These courses need not be in the same area, so you could, for example, take Human Biology I and Stellar Astronomy. Many courses in the College of Science are intended for science majors and therefore may be more in-depth than what is needed to satisfy this requirement. A full listing of Lab Science courses can be found at [http://www.rit.edu/cos/advisingstudentservices\\_labscience.php](http://www.rit.edu/cos/advisingstudentservices_labscience.php).

### **Seminars (3 credits)**

All entering freshmen are required to take the two-course sequence **First Year Enrichment** (FYE) in the fall and winter quarters of the first year. This course sequence is offered by the Student Affairs division to help ease the transition to college. If you complete **both** quarters of FYE, you also meet the Institute's Wellness requirement. If you do not complete both quarters of FYE, then you must pass Wellness for Life (1107-026) and make up any missing credits hours for graduation with free electives.

The IT **Freshman Seminar** is a largely non-technical introduction to Information Technology and the Information Sciences and Technologies department for students making the transition from high school to college. Transfer students and adult learners are exempt from this course.

### **Liberal Arts (36 credits)**

This block of courses is the standard Liberal Arts curriculum for almost all BS degrees at RIT. The College of Liberal Arts sets this curriculum, and they maintain their own advising center on the second floor of the Liberal Arts building, across from the Library (06-2210, 475-2444). If you have any questions about Liberal Arts transfer credits, Liberal Arts concentrations, or anything else in this block of courses, you'll have to see a Liberal Arts advisor. In particular, you'll need to see a Liberal Arts advisor about declaring your Liberal Arts concentration or minor, which you normally would do after you complete the six-course Liberal Arts core. If you choose a five-course minor in Liberal Arts, three of those courses can fit into the three-course

advanced concentration block, and the other two courses can fit into the General Education Electives block, as described in the section on Minors.

This block consists of the following requirements from the College of Liberal Arts:

- (1) Writing (4 credits)
- (2) Two humanities foundation courses (8 credits)
- (3) Two social science foundation courses (8 credits)
- (4) One “Arts of Expression” foundation course (4 credits)
- (5) A three-course advanced concentration at the 400/500 level (12 credits)

### **General Education Electives (16 credits)**

This elective block is intended to provide a “broadening experience” and must be chosen from courses in Liberal Arts, Science, Math, or selected courses in other colleges. This block is not intended for additional IT courses.

One of your general education electives must be a **Communication Elective**. Options for this restricted elective include professional communication, technical writing, foreign language, public speaking, sign language, or another course relating to interpersonal communications taken from any department. If such a course is taken as part of a Liberal Arts concentration, this course slot reverts to an unrestricted General Education elective.

### **Free Electives (24 credits)**

You may choose 24 credits in electives from any department at the Institute, including Information Technology. The intent of these selections is to enable you to develop expertise in a domain where you wish to apply your skills in information technology. Ideally, these selections will enable you to gain insight into the culture, standards, and practices of your future career environment. Some students, who want to gain greater depth in IT, may use some or all of these course slots for advanced IT courses beyond their IT concentrations.

### **Co-Op**

The Information Technology program requires 3 quarters of co-op experience. Co-op is short for *co-operative education*, and is a system in which you, the student, gain real-life work experience. You will be paid while employed, but more important, you gain on-the-job experience that will be valuable when you graduate and begin to search for a full-time position. To help you find a job, the Co-op and Career Services Office at RIT maintains job listings from companies locally, across the U.S. and all over the world. To view current listings, please go to the Office of Co-op and Career Services website at <http://www.rit.edu/emcs/oce/>.

To be eligible for co-op, you need to have completed at least 68 credits with at least 24 credits of IT courses, including either Programming for Information Technology III (4002-219) or Java for Programmers (4002-414). Additionally, transfer students must attend at least one quarter of classes at RIT (most do two or three quarters) before they are eligible for their first co-op.

RIT’s expectation is that you will complete all of your co-op requirements *before* you finish your last classes. Another way of stating this is that you’re discouraged from completing your degree on a co-op.

One final consideration: since most students are on co-op in the summer, the summer course offerings are sparse, particularly at the IT concentration level. With that in mind, it may be best to plan your double block so that it includes the summer quarter (spring/summer or summer/fall).

Ideally, your first co-op experience will be during the summer after you complete the second year of the program. Probably the best way to approach searching for a co-op job is to attend a co-op orientation session given by the IT co-op advisors. These orientation sessions are required to get you registered with the Co-op Office and they tend to occur early in each quarter. The topics cover procedural issues like signing up for interviews and registering a job you may have found on your own, as well as advice on creating an effective resume and other ways of presenting yourself as professionally as possible.

A good timeline for getting your first co-op job would be to attend the co-op orientation at the beginning of the winter quarter (in December) of your second year, nail down your resume and get your website in shape by the beginning of January, and be ready to respond quickly to opportunities in January. Interviews for summer co-ops will occur both in the winter and spring quarters. Once you accept an offer, you will need to register the job both with the Co-op Office via the Job Zone Web site, and with the School of Informatics Student Services and Academic Advising Center (70-2120). **You cannot register for co-op on SIS**; you must do so through the student services office, either by stopping by in person or by calling (585)475-2700.

Transfer students with an A.S. or A.A.S. degree from a two-year computing program should attend the co-op orientation in the fall quarter and get their resumes and website(s) in shape as soon as possible. It is likely that you will go on co-op for a spring/summer double block after only two quarters at RIT.

Many IT students get experience that is equivalent to co-op before they are eligible to register for a co-op. For instance, some students have done summer internships or taken summer jobs while still in high school that provide IT-relevant experience. Once you are eligible for co-op, you may petition to have one or more blocks of co-op waived. The process involves filling out a petition form (available on the "forms wall" outside the School of Informatics Student Services and Academic Advising Center (70-2120)) and having your manager send a corroborating letter on company letterhead to the department (details are included in the form). The absolute minimum for a co-op block is 350 hours (minimum of 35 hours per week for a minimum of 10 weeks).

For more information about co-op, contact Jill Jablonski at 475-5632. She is the co-op counselor assigned to the IT program at RIT's Co-op and Career Services office, and she can help you search for a co-op job. Hearing-impaired IT students also can work with Lynne Morley, who works at the NTID Center on Employment (475-6206).

### ***Independent Study***

Independent Study is just that -- something you study outside of a formally offered course. It is intended to allow you to pursue advanced topics not covered directly in a standard course. It is not intended to replace a required core course that is not offered at a convenient time. To do an independent study, you need to obtain the approval of a faculty sponsor. The best way to do

that is to write a brief proposal (one or two pages is usually enough), attach your proposal to the one-page independent study form (available on the forms wall outside the School of Informatics Student Services and Academic Advising Center (70-2120)), and then present your proposal to a faculty member who might be interested in sponsoring your study. Once the faculty member approves your proposal, it then goes to the Department Chair for final approval. Once approved by the Department Chair, you will automatically be registered for the Independent Study course.

### ***Minors***

Many students choose to “minor” in an academic area complimentary to their major. This is particularly appropriate in Information Technology, where IT skills are in demand throughout all segments of society. Many students use a minor to gain a depth in a specific domain in which they intend to practice IT. This domain knowledge can be very attractive to many employers, and RIT transcripts record any completed minors along with the student’s major.

A minor is a collection of five courses (20 credits hours) taken in a specific area outside of the major. For example, the College of Liberal Arts has a vast selection of five-course minors available, which use the three-course Liberal Arts concentration, augmented by two General Education Elective slots, as mentioned in the Liberal Arts section above. Minors are emerging in other areas as well, and these may be pursued by using the six Free Elective course slots and the 18-credit General Education Electives course block. More information on minors can be found at [http://www.rit.edu/programs/minors\\_listing.php](http://www.rit.edu/programs/minors_listing.php).

### ***Double Major***

The flexibility of the IT degree makes it very complimentary to other degree programs at RIT. The Information Sciences and Technologies (IST) department has partnered with other departments on campus to offer double major opportunities to IT students. If you are interested in pursuing a double major, please see your Academic Advisor.

### ***Study Abroad***

The American College of Management and Technology (ACMT) in Dubrovnik, Croatia offers the IT degree exactly as we offer it here at RIT. In fact, members of our faculty go to Croatia to teach IT courses. This provides IT students at RIT with a unique opportunity to study abroad and take courses that will apply to the IT degree! If you are interested in learning more about study abroad options, please see your Academic Advisor or visit RIT’s website on study abroad at <http://studyabroad.rit.edu/>.

### ***The Worksheet***

At the end of this handbook, you’ll find an IT worksheet that can help you plan your years here at RIT and will help you track your progress. The worksheet lists all of the required courses and shows you areas of electives and options. As you complete courses, enter them on your worksheet so that you know where you stand. As your plans and goals change, consult with your advisor to check your progress toward graduation. Please remember to **bring your up-to-date worksheet with you when you meet with your advisor** or anyone in School of Informatics Student Services and Academic Advising Center (70-2120).

## **When the Curriculum Changes**

Information Technology is an emerging academic discipline that we at RIT are helping to define with our curriculum. To help stay “ahead of the wave,” we tend to make changes to the curriculum on an annual basis. Most of these changes involve the addition of new courses and concentrations to address new trends in the field. When you matriculate in the IT program, we will put an IT worksheet in your folder (and give you a copy too, of course). This is the curriculum we will honor for you. If we make changes to the curriculum after you matriculate, you may choose to incorporate those changes in your worksheet. This policy is intended to give you the flexibility to stay with your original curriculum or take advantage of any curriculum changes that work to your advantage. If you have any questions about whether it makes sense for you to opt for a particular curriculum change, see your Academic Advisor or your Faculty Advisor.

## **Plan of Study**

### **How Many Courses to Take**

Four four-credit courses per quarter is considered a standard load at RIT, but full-time status includes anything from 12 to 18 credit hours. Below 12 credits is considered part-time; above 18 is an overload. If you are a full-time student, you should maintain at least 12 credits per quarter to insure that your financial aid stays intact (see the section below on Dropping or Withdrawing from Courses).

Taking an overload (20 credits, for example) is usually a mistake, for several reasons. First, you probably will have to pay more tuition for the fifth course (two credit hours of tuition to go from 18 to 20 credits). Second, our experience is that many students who attempt an overload end up withdrawing from one of the courses, which means that instead of paying half price for the fifth course, you pay a premium for the four you get through. Third, your grades are likely to suffer.

A particularly bad reason to try an overload is to “catch up” when you need to retake a course from an earlier quarter. For example, if you earn a D or F or withdraw from a course, it’s a really bad idea to retake that course in addition to the four new courses you were planning to take the next quarter. You should retake the course that you didn’t get through as soon as you can, but take it as part of a standard four-course load, not as an overload. One commonly stated motivation for wanting to overload a quarter is so that you can graduate “on time.” Graduating “on time” is an artificial constraint that becomes unrealistic when you need to retake courses. Your priority needs to be *that* you graduate, not *when* you graduate. As always, see an Academic Advisor to help plan your schedule.

The one situation where taking 20 credits probably makes sense is if you have exactly 20 credits left to graduate. In that situation, the fifth course will save you from taking an extra quarter, and if you’re that close to graduation, it’s probably worth the risk of not getting through all five courses. On the other hand, trying to take 20 credits each of your last two quarters (assuming you have exactly 40 credits left) is a bad idea. Take a 16 and two 12’s to get the forty credits, and use the spare time in the last two quarters to look for a job.

## When to Take What

The following list shows an “ideal” path toward graduation. Don’t feel that you are locked into this path, but realize that some courses are pre-requisites to others, and therefore, some courses should be taken earlier in your academic program. In the first two years, the focus is on introducing you to information technology and making you employable for co-op. The model schedule below is for students who have prior work in College Algebra and have not received AP credit. Students who will need to take College Algebra or have received AP credit or transfer credit will follow a modified schedule. It is important that you work closely with your Academic Advisor each quarter to plan a proper schedule.

Quarter	First Year	Second Year
<b>Fall</b>	<b>4002-320</b> Intro Multimedia: Internet & Web <b>4002-217</b> Programming for Info Tech I <b>1016-205</b> Discrete Math for Technologists I <b>05??-???</b> Liberal Arts core <b>4002-201</b> Freshman Seminar <b>1105-051</b> First-Year Enrichment I	<b>4050-350</b> Computer System Fundamentals <b>4002-331</b> Interactive Programming <b>10??-???</b> Lab Science Elective <b>05??-???</b> Liberal Arts core
<b>Winter</b>	<b>4002-218</b> Programming for Info Tech II <b>1016-206</b> Discrete Math for Technologists II <b>05??-???</b> Liberal Arts core <b>05??-???</b> Liberal Arts core <b>1105-052</b> First-Year Enrichment II	<b>4050-351</b> Network Fundamentals <b>4002-360</b> Database and Data Modeling <b>1016-319</b> Data Analysis I <b>05??-???</b> Liberal Arts core
<b>Spring</b>	<b>4002-219</b> Programming for Info Tech III <b>4050-220</b> Cyber Self Defense <b>10??-???</b> Lab Science Elective <b>05??-???</b> Liberal Arts core	<b>4002-425</b> HCI 1: Human Factors <b>4002-???</b> IT Elective/Concentration <b>1016-320</b> Data Analysis II <b>??-??-???</b> Elective/Concentration

After returning from the first co-op experience (typically the summer after you have completed the second year), you will take the remaining IT core courses and select your IT concentrations. In addition, you will select a Liberal Arts concentration or minor and will begin taking free electives and general education electives. The choices for the various concentrations and electives will in a large part determine when you will go out for the remaining co-op blocks, as these courses may be offered only during specific quarters, at which time you would have to be on campus taking classes.

The remaining IT core courses typically taken in the third and fourth years are listed below. These three courses should not be taken until after completing at least one block of co-op. Technology Transfer should not be taken until the fourth year.

- 4002-426** HCI 2: Interface Design and Development
- 4002-455** Needs Assessment
- 4002-460** Technology Transfer

Your schedule in years three and four is flexible, as you will be going on co-op during some quarters, while attending classes in others. As is the case for the first two years, you will find it easiest to “mix together” a few of each type of course every quarter, rather than take “all Liberal Arts” one quarter and “all IT” another quarter.

## Key People

### **Academic Advisors**

These are the folks to see about day-to-day advising questions like what to take next quarter, where a course would fit on the IT worksheet, course substitutions, taking a course at another college, advanced placement and transfer credits, co-op waivers and eligibility, and other nuts-and-bolts questions. When entering RIT, you will be assigned an Academic Advisor, however there are multiple Academic Advisors for the IT program, so feel free to seek assistance from any of them. In fact, if you have a quick question for an advisor, you can send an email to the address below to have an available academic advisor respond. The Academic Advisors maintain open office hours for quick questions and meet with students by appointment, which can be scheduled through the receptionist in the **School of Informatics Student Services and Academic Advising Center**.

Location: **70-2120**  
Telephone: **475-2700**  
Email: [informaticsugrad@rit.edu](mailto:informaticsugrad@rit.edu)

### **Faculty Advisor**

Your Faculty Advisor is a member of the Information Sciences and Technologies faculty and is the person to see for professional mentoring, like what kinds of jobs an IT concentration prepares you for, what are the trends in the IT industry, which co-op job sounds better, and other questions that require first-hand knowledge of the IT field. Your assigned faculty advisor may or may not be in an IT specialty area you are interested in, so feel free to seek mentoring from any Information Sciences and Technologies faculty member whom you respect and feel comfortable with, whether or not that person is your assigned faculty advisor. The faculty maintain open office hours during the week, which are posted outside their office doors, and you can also set up appointments with them as well or email them.

### **Tutors**

The department offers free tutoring services to IT students in our Information Technology Open Computing Lab/IT Tutoring Center (70-2670). Their hours for the quarter are posted outside of the lab. There are tutors for our web, database and programming courses.

Tutoring is also available in many non-IT courses through the department offering the course. For example, the Mathematics Department staffs a tutoring center with full-time faculty. RIT's Academic Support Center also offers a full array of services for all students, which includes tutoring in specific areas like writing and math, and focused workshops on study skills, career choices and many other topics useful to students. If you are looking for tutoring services and need some assistance, feel free to talk to an Academic Advisor.

## About Registering for Courses

### **Register Early!**

You can register for courses via the Student Information System (SIS) Web site (<https://infocenter.rit.edu/>). Registration is done both by *year level at RIT* and on a *first come first served* basis. That means that upperclassmen get first crack at courses before first and second year students. However, it still pays to register as early as you can. If you wait, you will find many courses closed. The annual *RIT Registration Guide* lists registration dates along with instructions for on-line registration and lots of other stuff. This guide is available in hard copy all over campus and as a PDF from the Info Center (<https://infocenter.rit.edu/>).

Every student on campus takes Liberal Arts courses. As you might suspect, some of these courses are more popular than others, and, therefore, enrollment is limited in some courses (generally assigned on a first-come, first-served basis). Therefore, you will find that you get a better selection of courses if you register as early as possible.

This enrollment pressure is also true of IT courses. Since there are lots of IT students, register as early as you can to maximize your chances of getting what you want. If you have trouble putting together a schedule, see an Academic Advisor for alternatives.

### **Dropping or Withdrawing from Courses**

Sometimes you get into a class and you realize that either (a) you are not prepared with the right background for the course or (b) you have overloaded yourself with too much work for one quarter. When this happens, you should either drop or withdraw from the course as soon as possible. While this may seem like a formality, it is essential that you do this as soon as possible. The three alternatives for handling such a class are listed below:

1. If you *drop* a course in the first 6 days of any quarter, then the course will not appear on your transcript at all. You can do this yourself in the first 6 days of the quarter, using the Student Information System (SIS) Web site (<https://infocenter.rit.edu/>) or you can stop by the School of Informatics Student Services and Academic Advising Center (70-2120) and ask one of the office staff to help you. After the sixth day of the quarter, you will have to withdraw from the course.
2. If you *withdraw* from a course between the second week and the eighth week, then a “W” appears on your transcript, indicating that you withdrew from the course. You can use SIS to withdraw from a course electronically, but you should meet with your instructor and academic advisor first to discuss your options. You cannot withdraw past the eighth week of class, which means that **you need to decide before the end of the eighth week** if you are going to remain in the course.
3. If you don’t officially drop or withdraw, but simply stop attending, you will end up with an “F” for the course, which becomes part of your official transcript at RIT, lowers your GPAs, may restrict financial aid, and is generally an embarrassment. If you are feeling overloaded, **see your Academic Advisor** and map out a plan immediately! If that plan includes withdrawing from a course, then do so as soon as possible so that you can focus on saving your remaining courses.

If you didn't make it through a course, the best thing to do is to try that course again as soon as you can schedule it. However, don't try to retake a course as an overload to "catch up." See the discussion on overloads in the section above on "How Many Courses to Take."

## Grade Point Averages (GPAs)

At RIT there are three GPAs: your cumulative GPA (computed from every course you've ever taken at RIT), the GPA in your principle field of study (PFOS) (just your IT courses, once you have enrolled in 20 credits of IT courses), and your quarterly GPA (just the courses you took in a particular quarter). If any of these GPAs falls below 2.0 for a given quarter, then you will receive a first academic probation notice that warns you of this fact. If any of these GPAs is below 2.0 for a second consecutive quarter, then you will receive a second probation notice.

Finally, if you have three or more quarters below 2.0 with the last two consecutively, then you likely will be suspended. Also, if your quarterly GPA falls below 1.0 for any single quarter, you are likely to be suspended, regardless of your other grade point averages. Suspension means that you cannot register for courses at RIT for one year (four quarters) and you will need to re-apply to the program.

If you find yourself having general academic difficulty, then you definitely should consult with one of the Academic Advisors. They can help you identify problems, recommend strategies and services, and formulate a plan to keep you in good standing. Do not wait until you are in over your head before you ask for help!

## Applying for Graduation

When you get within two or three academic quarters of finishing all your requirements for graduation, you should apply for graduation in the School of Informatics Student Services and Academic Advising Center (70-2120). This process includes several steps. First, you should stop in the center to pick up a "degree application form" and make an appointment with one of the Academic Advisors.

Before your appointment, visit the Liberal Arts Advising Office (06-2210, 475-2444) to get an updated Liberal Arts worksheet to bring with you to your appointment with the Academic Advisor. If you have any issues about where a Liberal Arts course fits in the Liberal Arts block, the advisors at the Liberal Arts Advising Office will be able to assist you, because they "own" the 36 credits in that block and decide what counts where.

Next, bring both the Liberal Arts worksheet and the filled out degree application form to your appointment with the Academic Advisor. At that appointment you will get your IT worksheet up to date, find out exactly what you have left to graduate, and plan when you are likely finish everything up.

When you are in your last quarter of classes, you will need to fill out an on-line **exit survey**. This is an important mechanism for us to assess our program, and it gives you a chance to give us feedback from the perspective of someone who has just about finished. You will receive an email in your last quarter reminding you to fill out the survey and providing the URL. As a bonus, the Academic Advisors provide IT-related swag for completing the exit survey, which you don't want to lose out on!

After the grades are in for the quarter in which you expected to complete your degree requirements, we will look at the credits you have earned since the time you applied for graduation and check them against what you had left at that time. If you have filled in all the blanks, so to speak, you are done, and we will certify you for graduation! If not we will send you a “lack letter,” which lists what you lack for graduation. We will keep sending you a lack letter every quarter until you graduate or until four quarters goes by. If four quarters pass from the time you said you were going to finish in your degree application, we might ask you to apply for graduation again.

If four quarters go by without any registration activity from you (you don’t register for any courses at RIT, including co-op, for a whole year), you risk being declared “inactive,” which may result in your having to reapply to the IT program through the Admissions office. If that happens, you might end up losing some credits because you’ll be reapplying for the curriculum as it stands at the time you reapply, not the curriculum you came in under originally. Bottom line: don’t put off finishing that last course or two, and keep the School of Informatics Student Services and Academic Advising Center informed about where you are and what your plans for graduation are.

## Course Descriptions

Below you will find course descriptions for the all the information technology courses that count toward the Bachelor of Science degree in Information Technology. They are organized to be consistent with the way they appear on the IT worksheet. **If an IT course does not appear here, it may not count in the IT major.**

### ***Information Technology Core Courses (52 credits)***

These courses are required of all IT majors. They are listed in the order in which they would be taken by an entering freshman with no transfer credits. Any prerequisites for a course are listed in parentheses.

#### **4002-320 Introduction to Multimedia: The Internet and the Web (4 credits)**

This class provides an introduction to key Internet, web, and multimedia technologies, as well as familiarity with the Macintosh computer platform. Topics covered include social communication, basic Internet applications such as SSH, SFTP, and the World Wide Web, basic digital image techniques, and web page development and publishing. (Computer literacy)

#### **4002-217 Programming for Information Technology I (4 credits)**

This is the first course in the introductory programming sequence required for all Information Technology students. Topics include elementary data types, arithmetic and logical operations, control structures and error handling, methods and functions, and an introduction to object-oriented programming design and implementation. Emphasis is placed on the development of problem-solving skills. Programming projects are required. (Computer Literacy)

#### **4002-218 Programming for Information Technology II (4 credits)**

This is the second course in the introductory programming sequence required for all students majoring in Information Technology. Topics include further exploration of classes and objects, programming through composition and inheritance, reusability, input/output, and object oriented design. Emphasis is placed on the development of problem-solving skills. Moderately large programming assignments are required. (4002-217)

#### **4002-219 Programming for Information Technology III (4 credits)**

This is the third course in the introductory programming sequence required for all students majoring in Information Technology. Topics include advanced interface concepts, traditional programming data structures, programming utilities and reusability, introductory project design and management concepts and other concepts as time permits. Emphasis is placed on the development of problem-solving skills. Large programming assignments are required. (4002-218 or 4002-221)

#### **4002-414 Java for Programmers (4 credits)**

This course is intended for students with previous programming experience in a language other than Java and who also have some background in object-oriented programming. It is a rapid deployment of the introductory Programming for Information Technology sequence (4002-217 through 4002-219) and may not be taken as an Information Technology elective or concentration course by those who have completed that sequence. This course covers the creation of application programs. Topics include: basic language concepts (declaring and evaluation of data, statements, expressions, control flow, and input/output), object-oriented fundamentals, GUI interfaces, exception handling, debugging, threads, and the client/server environment. Programming projects will be required. (Two-course programming sequence in any language except Java)

#### **4002-331 Interactive Programming (4 credits)**

This course teaches students how to program interactive components to create user interfaces and information visualization systems. Students will work with data, information, animation, and digital media to create interactive applications. Students will be introduced to visual layout and design concepts. Programming is required. (4002-219, 4002-320).

**4050-220 Cyber Self Defense (4 credits)**

This course will teach students how to recognize a potential cyber attacker and identify their own vulnerabilities so that they can defend themselves, their information and their identity. Students will be introduced to the tools and techniques to defend against, react to and recover from a cyber attack.

**4050-350 Computer System Fundamentals (4 credits)**

This course provides the student with an understanding of computer architecture and its interaction with the operating system. Topics include: operating systems, software and hardware interaction, permanent and removable data storage, input and output devices, printing, video, and system upgrades. (1016-205)

**4050-351 Network Fundamentals (4 credits)**

Network technologies and standards are discussed with in-depth coverage of layers 1, 2, and 3. Topics include, but are not limited to, access control, framing, operation of layer 2 protocols including wired and wireless technologies, network protocols (IPv4, IPv6 and IPX), transport protocols (TCP, UDP, and SPX), network security, subnetting, and network hardware. (4050-350, 1016-205)

**4002-360 Introduction to Database and Data Modeling (4 credits)**

A presentation of the fundamental concepts used in data modeling and database implementation. The data modeling process, basic relational concepts, and the process of normalization, relational algebra, SQL, and guidelines for mapping a data model into a relational database will be covered. Programming assignments involving the use of a relational database management system will be required. (4002-218 or equivalent and 1016-206)

**4002-425 HCI 1: Human Factors (4 credits)**

Human Computer Interaction (HCI) is a multidisciplinary field of study concerned with how humans interact with software and hardware interfaces. This course will focus on theories of human information processing, human behavior and their implications for user-centered design of interfaces. Topics include: HCI history, cognitive psychology, user analysis, task analysis, and requirements analysis in the usability engineering process. (Second-year standing)

**4002-426 HCI 2: Interaction Design (4 credits)**

The design of usable interfaces is based on the principles and theories of Human Computer Interaction. This project-based course is focused on the application of the usability engineering process, including analysis, design, prototyping and testing. Additional topics include: What is Usability, Heuristic Evaluation, Usability Goal Setting, Interaction Design and Styles, Assessment Methods and International User Interfaces. Team projects are required. ((4002-425 or 2009-323) and (4080-330 or 4080-231))

**4002-455 Needs Assessment (4 credits)**

Complex problems in modern organizations require an information technologist to systematically analyze problem areas to determine the most effective and cost-efficient solutions. This course builds student skills in two different yet interacting areas: needs assessment (requirements analysis) and group problem solving. Students use interviewing and problem-solving techniques to uncover the constraints that surround problem areas. Students learn the questions to ask during needs assessment, along with developing the interpersonal skills to conduct these meetings. Emphasis is on the steps in creative problem solving, the basics of meeting planning to maximize group effectiveness and helping a client to focus concerns into a clearly defined problem. (Third-year standing and co-op experience)

**4002-460 Technology Transfer (4 credits)**

Technology transfer is an umbrella term that refers to the creation, adoption, and consequences of new technologies in a variety of settings. This course looks at how a new idea becomes implemented in a system (an organization or society) and the factors that influence the adoption of a new idea. The course also looks at the influence of individuals and groups within the change process and how they affect the acceptance of new ideas. Finally, the course explores the prediction and consequences of new technologies. (Third-year standing and Co-op experience)

## **Information Technology Concentrations (24 credits)**

At the present time there are nine concentration areas, listed below. Some of the concentrations are made up of three specific IT courses, while others consist of four or more courses from which you would choose three. The concentration areas are listed below, and the course descriptions for each concentration follow.

- (1) Web Development
- (2) Database
- (3) Web-Database Integration Track (six courses, both concentrations)
- (4) Advanced Application Development
- (5) Learning and Performance Technology
- (6) Medical Informatics
- (7) Network and System Administration
- (8) Geospatial Informatics
- (9) Special Topics

### **(1) Web Development**

#### **4002-409 Web Site Design and Implementation (4 credits)**

This course builds on the basic aspects of web page development that are presented in 4002-320 and extends that knowledge to focus on theories, issues, and technologies related to the design and development of web sites. An overview of web design concepts, including usability, accessibility, information architecture, and graphic design in the context of the web will be covered. Introduction to web site technologies, including HTTP, JavaScript, DHTML, PHP, and database dynamic page generation will also be explored. (4002-320, 4002-360 and a two-course programming sequence; co-requisite: 4002-360)

#### **4002-535 Network-Based Multimedia (4 credits)**

This course presents of the foundational concepts underlying the design and implementation of multimedia on the Internet. Each concept is explored along with the underlying technology that supports it and hands-on projects. As the technology of interactive multimedia on the Internet changes, this course presents the current practices in preparing multimedia for cross-platform delivery to the massive audience of Internet users. Using the capabilities of current web browser client and http server technology, students will implement interactive multimedia for a variety of applications, including streaming audio and video. (4002-409 or 4002-406)

#### **4002-536 Web Client Side Programming (4 credits)**

This course will explore the possibilities and purpose of client side scripting over the Internet. Students will learn to use both native and plug-in technologies to build interactive interfaces that are both usable and effective. Key features that will be addressed are browser compatibility, object reusability (bandwidth issues), and different scripting environments. Programming is required. (4002-409)

#### **4002-539 Programming for the WWW (4 credits)**

This course focuses on the server-side aspects of web application development. Topics covered include the underlying protocols and technologies of the WWW, dynamic generation of web pages, accessing database content, web services, online content management, and security. By the end of the course, students will be able to architect and develop multi-tiered dynamically generated web sites and services that incorporate server-side programming and a database back-end. (4002-409 and a two-course programming sequence)

**4002-546 Web Client-Server Programming (4 credits)**

When building sophisticated web applications, Client and Server technologies are used together to create the best possible web-based applications. This course will explore the creation of such integrated applications, exploring topics such as dynamic creation of web technology based applications in a client-server environment. Programming projects are required. (4002-536 and 4002-539)

**(2) Database****4002-461 Fundamentals of Data Modeling (4 credits)**

Students will survey and master several contemporary graphic techniques used in data modeling and data requirements collection and analysis. Conceptual, Logical, and Physical modeling will be compared and contrasted. Business rule formation and domain identification will be studied. Advanced functional dependency and higher-order normal forms will be examined in the context of requirements analysis. Object-oriented DBMS concepts and design issues will be surveyed. (4002-360)

**4002-484 Fundamentals of Database Client/Server Connectivity (4 credits)**

Students will investigate strategies for client-server and server-server communication against single or multiple database servers. Specifically, students will configure, test, and demonstrate successful communication between multiple database servers and multiple clients. Similarities and differences between commercially available connectivity packages, and issues impacting performance will be explored. Programming exercises are required. (4002-360 and 4002-219 or equivalent)

**4002-485 Fundamentals of DBMS Architecture and Implementation (4 credits)**

Students will be introduced to issues in client-server database implementation and administration. Topics such as schema implementation, storage allocation and management, user creation and access security, data backup and recovery, and performance measurement and enhancement will be presented in lecture and investigated in a laboratory environment. Students will configure and demonstrate successful management of a database server for client access. (4002-360; corequisite: 4002-485 lab)

**(3) Web-Database Integration Track**

Students who want to focus on enterprise-level Web-database deployment may wish to choose the following six-course track, which integrates the database concentration with Web content development and provides a project-based capstone course (4002-486), which requires all the other courses in the track as prerequisites. This track would fill in **both** IT concentrations (all 24 credits).

**4002-484 Fundamentals of Database Client/Server Connectivity (4 credits)**

See course description in the Database concentration above.

**4002-485 Fundamentals of DBMS Architecture and Implementation (4 credits)**

See course description in the Database concentration above.

**4002-461 Fundamentals of Data Modeling (4 credits)**

See course description in the Database concentration above.

**4002-409 Web Site Design and Implementation (4 credits)**

See course description in the Web Site Development concentration above.

**4002-539 Programming for the WWW (4 credits)**

See course description in the Web Site Development concentration above.

**4002-486 N-Tier Web Application Development (4 credits)**

In this project-based course, students will complete the entire software development lifecycle for a web-based, n-tier application. This course provides a capstone experience for students to apply and extend knowledge acquired from the prerequisite courses to complete the assignments. An exploration of project scheduling along with alpha and beta testing will be included. (4002-461; 4002-484; 4002-485; 4002-539)

## **(4) Advanced Application Development**

### **4002-571 Application Programming (4 credits)**

This course will illustrate advanced programming topics using an object-oriented language. Topics include the use of common programming tools, working with component models, simple graphics programming, application development spanning multiple languages, and security models. Emphasis will be on the development of problem solving skills. Programming assignments will be required. (Third-year standing and either 4002-219 or 4002-414)

### **4002-572 Distributed Application Programming (4 credits)**

This course will expose students to advanced programming topics using an object-oriented language. It will build on the material covered in the introductory programming courses. Topics include distributed programming using various APIs and the development of server side applications. Emphasis will be on the development of problem solving skills. Programming assignments will be required. (Third-year standing and either 4002-219 or 4002-414)

### **4002-575 Local Data Integration (4 credits)**

In this course, students will learn how to utilize state of the art techniques, such as XML, to address the issues of data integration between computer programs of disparate language platforms. Programming projects will be required. (Third-year standing and 4002-219 or 4002-414)

### **4002-576 Remote Data Integration (4 credits)**

Exchange of information between programs running on disparate software and hardware platforms can be a significant problem. In this course, students will learn how to leverage the loose coupling of service-oriented architectures to address the issues of data integration between these types of computer programs when executing across domains. Programming projects will be required. (Third-year standing and 4002-219 or 4002-414)

## **(5) Learning and Performance Technology**

### **4002-510 Fundamentals of Instructional Technology (4 credits)**

The world of information technology offers the possibility of transforming the way that instruction is designed and delivered. However, few information technology professionals understand the methods and materials of instructional design. As a professional in information technology, a student may be responsible for designing instruction--either in a business or an educational context. This course enables the student to be able to plan, organize, and systematically develop instructional materials. The course uses an Instructional Systems Design (ISD) model to analyze, design, deliver, and evaluate instruction. (Third-year standing)

### **4002-512 Interactive Courseware (4 credits)**

Computer software that teaches is referred to as *courseware*. This course was designed to help you make the transition from "general" Instructional Design (4002-510) into the actual application of these principles in a computer-based environment. Although the basic principles of instructional design hold true in all media environments, using these teaching and learning principles is somewhat different when developing instruction that will be delivered by computer. This course teaches procedures that have already been successful in the design and development of courseware. (4002-510 and a two-course programming sequence)

### **4002-525 Performance Support Systems (4 credits)**

This course provides an introduction to non-instructional methods of human performance improvement. Electronic Performance Support Systems (EPSS) are software technologies, designed to give each user what he or she needs when he or she needs it. It is designed to enable skilled performance without training. Knowledge management systems use a variety of means to capture, encode, store, and retrieve knowledge. This course examines emergent literature supporting EPSS and knowledge management and provides students with opportunities to design and develop several different components of these systems. (A two-course programming sequence and third-year standing)

## **(6) Medical Informatics**

This concentration consists of courses from the BS in Medical Informatics, which is offered by the IST department. The prerequisite to the concentration is 4006-310, Developing Medical Applications, which may be taken as a Free Elective.

### **4006-410 The Electronic Health Record (4 credits)**

This is an in-depth study of the acquisition, storage, and use of information in the electronic health record (EHR). Students will learn about the types of information used in clinical care: text, structured data, images, and sounds. Other topics covered include: clinical vocabularies (existing schemes and their limitations); how clinical information is generated and utilized; methods of information storage and retrieval; departmental systems (laboratory, radiology, and hospital information systems); organizational systems (including scheduling, registration and financial systems); and the legal, social and regulatory problems of EHRs including security and confidentiality. In addition, students will work with the CACHE post-relational database management system. Programming assignments will be required. (4006-310 and 4002-360)

### **4006-420 Medical Database Architectures (4 credits)**

This is an in-depth study of database architecture used in the medical field. Students will learn about the different types of database architecture in support of medical education, clinical research and clinical applications. Database design and programming assignments will be required. (4006-410)

### **4006-430 Medical Application Integration (4 credits)**

This course will provide students with an understanding of application integration in healthcare. Java programming assignments will be required. Students will also learn medical business processes and how they impact data integration within a hospital. Middleware message brokers will be examined along with the use of the HL7 messaging standard. Web services and other forms of data integration will be studied. (4006-410 and (4002-219 or equivalent))

## **(7) Networking and System Administration**

This concentration consists of courses from the Department of Networking, Security and Systems Administration (NSSA), specifically core courses from their BS program in Applied Networking and System Administration (ANSA) that are beyond those used in the IT core (4050-350 and 351). You may choose any three of these courses for this concentration in IT, but be sure to follow the prerequisites (specifically, 4050-402). Additional advanced courses from the NSSA department would certainly count in this concentration as well, but they are only available to IT students by permission of the chair of the NSSA department and on a space-available basis.

### **4050-402 OS Scripting (4 credits)**

This course is a survey of tools and techniques used to script common tasks in operating system environments. It will focus on Unix shell script programming. Students will gain experience in writing scripts for Unix and will be challenged to bend traditional programming paradigms to the writing of effective scripts in the OS environment. Programming projects will be required. (4002-218 or equivalent and 1016-206)

### **4050-403 Concepts of Wireless Data Networking (4 credits)**

This course is designed to provide the student with an understanding of the principles and concepts of radio and optical communication as they apply to wireless data networking for local area networks and peripherals. Included in the course will be an examination of modulation techniques, measurement standards, nomenclature, equipment and theory behind transmissions in this portion of the electromagnetic spectrum. (4050-351)

**4050-421 Systems Administration I (4 credits)**

This course is designed to provide students with essential knowledge and skills in system administration. Basic operating system concepts, such as file systems, processes and threads, memory management, and input/output are covered to provide students with an understanding of the fundamentals of a computer system. Services including Remote Procedure Call (RPC), Network File System (NFS), Network Information Service (NIS), Server Message Block (SMB), Services for Unix (SFU) are introduced. (4050-402 or 4050-521, 4050-350, 4050-351)

**4050-515 Introduction to Routing and Switching (4 credits)**

This course is a laboratory-based course that focuses on the standards and technologies used to establish inter-network structures that will support a TCP/IP data stream for higher-level services to operate over. It is primarily concerned with the network layer and below. Although the course focuses on the TCP/IP protocol suite and the Ethernet LAN protocol, other protocols may be studied. Students will use their knowledge of how to connect computers (PCs) in a LAN and learn how to connect separate networks together to form an internet. Bridging and switching concepts are investigated (such as the resolution of bridging loops through the appropriate algorithms). Routed and routing protocols and algorithms are studied and implemented. (4050-351)

**4050-516 Network Services (4 credits)**

An investigation of the tasks of selecting, configuring and administering services in an internetworking environment. Topics include the TCP/IP protocol suite, service administration including DHCP, DNS, SSH, and Kerberos. Students completing this course will have experience in administering an internetwork of computers with a variety of these services as well as an understanding of the similarities and differences between protocols in the TCP/IP suite (TCP and UDP). (4050-402 and 4050-351)

**4050-521 Perl for System Administration (4 credits)**

This course will provide students with an introduction to the Perl programming language, with examples and problems drawn from the system administration arena. After covering the essentials of the language, students will be taught how to create Perl Objects, and install modules for use on a computing system. Application areas for Perl scripts will include file system walking programs, user account creation and manipulation, and the processing of log files. (A two-course object-oriented programming sequence)

**(8) Geospatial Informatics****4002-248 Introduction to Geospatial Technologies (4 credits)**

This course provides a survey of technologies used to represent the earth, collectively referred to as Geospatial Technologies (GTs). Students will gain hands-on experience with GTs, including Global Positioning Systems (GPSs), Geographic Information Systems (GISs), remote sensing, Virtual Globes, and Web mapping mashups. Students also will develop basic spatial thinking, reasoning and literacy skills.

**4002-348 Introduction to Geographic Information Systems (GIS) (4 credits)**

This course introduces students to Geographic Information Systems (GIS). Course lectures, reading assignments, and practical lab experiences will cover a mix of conceptual, practical and technical GIS topics. Topics include GIS data models, basic cartography, geodatabases, spatial analysis, and geo software. (4002-248 or permission of instructor)

**4002-448 Geospatial Data Analysis (4 credits)**

This course is an introduction to the theory and techniques used for spatial analysis of complex, geographically referenced data. Topics include advanced statistical and spatial data analysis techniques for a variety of problem types that span a broad spectrum of disciplines. In-class and out-of-class assignments will develop students' spatial data analysis skills. (4002-248, 4002-348, and 1016-320 (or equivalent background in statistics) or permission of instructor)

## **(9) Special Topics Concentration**

A student may propose a custom concentration of twelve upper-division credits, either by mixing courses from the other IT courses or by choosing courses from a different department at the Institute. The objective of this alternative is to provide students with the opportunity to follow special study interests. This concentration must be approved by the Department Chair, and may be used for only *one* of the two required IT concentrations. Below are some courses that may be of interest to you.

### **4002-415 Ethics in Information Technology (4 credits)**

Ethics in Information Technology is intended to be an introductory course to the various ethical issues which may present themselves in our concentration areas: Human Factors, Database, Networking, Multimedia, Gaming, Systems Administration, and Programming. The class will start with a historical examination of ethics and, through research, presentations and discussions, will provide opportunity to learn why it is essential to understand the ethical implications of our professional activities. Topics include: global implications of technology, 1<sup>st</sup> Amendment, 4<sup>th</sup> Amendment, security, intellectual property law, and personal responsibility. (Second-year standing)

### **4002-416 Access and Accessibility (4 credits)**

This course will examine the increasingly important problem of accessibility as it relates to the field of computing. Issues to be covered include: accessibility for disabled people, assistive technologies, the effect of poverty on accessibility (the “digital divide”), restrictions on the use of public machines, and the moral, legal, and ethical issues associated with accessibility. (Third-year standing)

### **4002-462 Introduction to Bioinformatics Computing (4 credits)**

This course will provide a theoretical and practical (lab-based) study of computational genomics. Techniques will be studied for quickly and effectively commandeering computing resources to the solution of problems raised in the realm of biology. Prior experience in programming and a basic understanding of molecular biology (Central Dogma) are required. Course topics include, an express tour of some bioinformatics resources, exact and approximate pattern matching, sequence alignment, gene prediction, fragment assembly, multiple alignment, statistical and machine learning approaches. (A three-course object-oriented programming sequence and 1016-265)

### **4002-563 Functional and Translational Bioinformatics Computing (4 credits)**

This course will provide an in-depth exposure to advanced techniques in computational genomics with an emphasis on functional and translational bioinformatics. Topics may include: Gene Finding, Genetic algorithms, Hidden Markov models, Neural networks, Gene Expression Analysis, Clustering algorithms, Gene Mapping in Simple and Complex Diseases, SNP analysis, Pharmacogenetics/Pharmacogenomics, Molecular Network Analysis, Probabilistic framework for modeling and inference, Systems Biology. (A three-course object-oriented programming sequence, 1016-265, and 1016-319)

### **4080-527 Introduction to Digital Audio Production (4 credits)**

Technologies and techniques for producing and manipulating digital audio are explored. Topics include digital representation of sound, digital audio recording and production, MIDI, synthesis techniques, real-time performance issues, and the application of digital audio to multimedia and Web production. (4080-309 or 4002-409)

### **4002-549 Usability Testing (4 credits)**

This project-based course will focus on the formal evaluation of user interfaces. Topics include: usability test goal setting, recruitment of appropriate users, design of test tasks, design of the test environment, test plan development and implementation, analysis and interpretation of the results, and documentation and presentation of results and recommendations. (4002-426 and 1016-319)

**4002-590 Seminar in Information Sciences and Technologies** (4 credits)

Current topics and advances in applications of computer technology for undergraduate students (Permission of instructor and third-year standing).

**4002-599 Independent Study** (1-4 credits)

The student will work independently under the supervision of a faculty advisor on a topic not covered in other courses. (Proposal signed by a faculty member)



# Worksheet - B.S. in Information Technology – VKSF(full-time)/VKSZ(part-time)

Name: \_\_\_\_\_ Entry Quarter: \_\_\_\_\_

Transfer School: \_\_\_\_\_ I. T. Concentrations: \_\_\_\_\_ / \_\_\_\_\_

**QH GR QTR I. T. CORE (52 QH)**

4			4002-320 Intro Multimedia
4			4002-217 IT Pgm I
4			4002-218 IT Pgm II
4			4002-219 IT Pgm III
4			4002-331 Interactive Programming or 4080-330 Interactive Digital Media
4			4050-220 Cyber Self Def
4			4050-350 Comp Sys Fund
4			4050-351 Network Fund
4			4002-360 Database
4			4002-425 HCI 1: Human Factors
4			4002-426 HCI 2: Interface Design
4			4002-455 Needs Assessment
4			4002-460 Tech Transfer

**I. T. CONCENTRATIONS (24 QH)**


**MATH & SCIENCE (26 QH)**

			1016-205 Tech Discrete Math I
			1016-206 Tech Discrete Math II
			1016-319 Data Analysis I
6			1016-320 Data Analysis II
			Lab Science Elective
			Lab Science Elective

**SEMINARS (3 QH)**

1			4002-201 Freshman Seminar
1			1105-051 FYE 1
1			1105-052 FYE 2

\* See list of approved courses on other side

Initial Credit Evaluation: \_\_\_\_\_ Date: \_\_\_\_\_

Graduation Certified \_\_\_\_\_ **Date:** \_\_\_\_\_

**QH GR QTR LIBERAL ARTS (36 QH) \***

4			0502-227 Writing
4			Humanities
4			Humanities
4			Social Sciences
4			Social Sciences
4			Arts of Expression
4			Lib Arts Concentration
4			Lib Arts Concentration
4			Lib Arts Concentration

For specific course requirements see: <http://www.rit.edu/cla/>

**GEN. ED. ELECTIVES (16 QH)**

			Communications Elective *

**FREE ELECTIVES (24 QH)**


**WELLNESS ACTIVITY (2 COURSES)**

0			Wellness (1107) or Activity (1108-1114)
0			Different Activity (1108-1114)

**CO-OP (3 QTRS)**

0			4002-499 IT Co-op
0			4002-499 IT Co-op
0			4002-499 IT Co-op

Credit Summary	Req'd	Initial
IT	76	
Science/Math	26	
Free Electives	24	
Liberal Arts	36	
General Ed Electives	16	
Seminars	3	
<b>TOTAL</b>	<b>181</b>	

**Liberal Arts Core:**

**Social Sciences** – Choose TWO from the following choices (must be from different disciplines):

- Cultural Anthropology (0510-210)
- Principles of Microeconomics (0511-211)
- American Politics (0513-211) **OR** Intro to International Relations (0513-214)
- Introduction to Psychology (0514-210)
- Foundations of Sociology (0515-210)

**Humanities** – Choose TWO from the following choices (must be from different disciplines):

- Literary and Cultural Studies (0504-210)
- Fine Arts (0505-213 or 0505-214 or 0505-215 or 0505-216)
- History (0507-301 or 0507-302 or 0507-305 or 0507-306)
- Science, Technology, and Society (0508-211 or 0508-212)
- Philosophy (0509-210 or 0509-211 or 0509-213)

**Arts of Expression**

**0504-319 (multiple sections offered each quarter, topics vary by quarter)**

- 0505-319 Shakespeare on Stage
- 0508-319 AE: STS Classics
- 0510-319 Ritual and Performance
- 0513-319 Politics through Film
- 0535-501 Public Speaking

**Liberal Arts Concentrations/Minors**

*There are multiple options for you to consider and you should discuss these with your advisor. For more information, including options, course offerings and how to declare a concentration/minor, please go to the Liberal Arts Student Services website and click on the student services/advising tab.*

**Communications Elective Options:**

*Courses not on this list must be preapproved to meet this requirement*

- 0502-443 Written Argument
- 0502-444 Technical Writing
- 0502-460 Science Writing
- 0535-403 Effective Technical Writing
- 0535-414 Interpersonal Communications
- 0535-415 Organizational Communications
- 0535-422 Ethics in Technical Communications
- 0535-480 Human Communication
- 0535-481 Persuasion

**Communications Elective Options (cont.)**

- 0535-482 Mass Communication
- 0535-483 Small Group Communication
- 0535-501 Public Speaking
- 0688-225 Interpersonal Communication Skills (2 credits)
- 0688-320 Professional Presentation
- 0688-325 Communicating in Business
- 0688-330 Technical Report Writing
- 0688-331 Report Writing (2 credits)
- 0688-333 Technical Writing and Editing
- 0688-356 Strategic Communications (2 credits)
- 0688-520 International Communication (2 credits)
- 0688-544 Writing for the Sciences

**Language\***

- 0525-390 American Sign Language
  - 0525-400 Beginning Arabic I
  - 0525-420 Beginning Chinese I
  - 0525-440 Beginning French I
  - 0525-460 Beginning German I
  - 0525-480 Beginning Japanese I
  - 0525-500 Beginning Italian I
  - 0525-520 Beginning Portuguese I
  - 0525-540 Beginning Russian I
  - 0525-560 Beginning Spanish I
- \*Beginning language courses can count as an Arts of Expression course OR a Communications elective. See your advisor for more information.*

**Lab Science Elective Options:**

*Courses not on this list must be preapproved to meet this requirement*

- 1017-211 College Physics I
- 1017-212 College Physics II
- 1017-213 College Physics III
- 1004-211/231 Human Biology I
- 1004-212/232 Human Biology II
- 1004-259 Human Biology III
- 1005-210 Field Biology for Non-Science Students
- 1006-202 Concepts of Environmental Science I
- 1011-201/205 Fundamentals of General Chemistry
- 1011-202/207 Fundamentals of Organic Chemistry
- 1011-271/205 Fundamentals of Chemistry
- 1017-202 Exploration in Physics
- 1017-230/231 Stellar Astronomy
- 1017-235/236 Solar System Astronomy
- 1026-220 Medical Lab Procedures
- 1026-222 Human Diseases
- 1051-215 Imaging Science Fundamentals
- 1051-217 Fundamentals of Astronomical Imaging
- 1099-260 Frontiers of Science I
- 1099-559 Frontiers of Science II