

Welcome to the Department of Mathematics and Computer Science!

You've come to us because you need to develop skills in mathematics and computer science in order to be successful in your future professional career. Our instructors and administrative associates would like to make your learning experience enjoyable and productive. Please read the contents of this handout carefully before you take your very first course with us.

- *What to expect.*

"Education is learning what you didn't even know you didn't know."

Daniel J. Boorstin.

First of all, expect a huge flow of new information. Be prepared to process it properly. In this handout, we give you some advice on developing good study habits (see "Study Skills" & "Time Management" below). Please take it seriously. If this is your first year of college, you will find many differences between the organization of classes at the high school and at the university. If you have a job, you should be very careful about balancing work and study hours.

- *Lectures.*

"Teachers open the door. You enter by yourself."

Chinese Proverb.

Most classes that you attend are lectures. This means that your instructor will explain new material to you, give supporting examples, and take your questions. It is NOT your instructor's job to go through each line of your textbook. The main goal of the lecture is to show *how to learn* new material in the course and *how to develop* new skills. So, do NOT expect that you will become fluent with new material during the lecture! This is only the first step. To get the necessary skills, you will have to spend 2 – 3 hours outside of class for each hour in the classroom. Reserve enough time for that in your schedule. You may need to reduce your work hours.

The size of your university classes will often be bigger than those you had in high school. When you arrive in class, find a convenient seat and try to concentrate on the subject of the lecture. Do not disturb your classmates, and try to remain undistracted yourself.

- *Syllabus.*

"A goal without a plan is just a wish."

Antoine de Saint-Exupery.

You will get a *syllabus* in every course that you take. This is a very important document for you. First of all, this is the plan of the course: here you will find the schedule of quizzes, exams, projects, etc. Also, a syllabus serves as a contract between you and your instructor. Read carefully each line of this document, and keep it until the final exam. If you stay in the class that means you have accepted the terms and conditions of this contract, including the grading scheme. Ask immediately if you have any questions about the contents of the syllabus.

- *Personal Responsibility.*

"Human beings, by changing the inner attitudes of their minds, can change the outer aspects of their lives."

William James.

At the university, absolutely no one will control you. This means that you have a lot of freedom. But with this freedom comes a lot of responsibility. You should develop and follow a daily schedule, where you have reserved enough time for your homework for all of your classes. Do your homework and read the required material, according to your instructor's requirements, before coming to the class! Your success starts with the proper attitude. It is next to impossible to pass a course with a good grade if you don't take it seriously. You need to set high goals and work on a daily basis. Be exciting about learning new ideas. If you love what you do, you will do it well.

- *Study Skills.*

“When all else fails, read the instructions.”

Agnes Allen.

Hopefully, you will not take the above quote seriously! It describes the worst possible approach to study any course. Unfortunately, it is also very typical. Students are usually very busy, and sometimes they try to save some time by not reading textbooks and class notes before doing their homework. In most situations, this results in a huge time loss and low grades. Courses are typically fairly complicated, and “reading instructions” is an investment in your success, not a loss of time.

“Nothing is as simple as we hope it will be.”

Jim Horning.

Try to implement a multisensory approach to your learning. You should take class notes during the lectures. Also, when studying at home, it is helpful to read material aloud, explain it to someone else, and make clarifying pictures. It may be a good idea to make review notes and to write a list of questions to each section, including problems that you can't solve. Of course, it takes time to implement these and other suggestions, but you are supposed to spend 2 – 3 hours outside of class for each hour in the classroom! Remember that getting good grades is only your secondary goal. The priority must be to build the strong background in mathematics and computer science that you will need in your professional life. It is worth your time and effort!

Always keep in mind what you have to learn every time you start to study. Check if you reach your goal when you are about to finish. In particular, you may want to double check whether you memorized all required information.

“I hear – and I forget. I see – and I believe. I do – and I understand.”

Confucius.

The most crucial part of your preparation must be **practice**, whether it is solving problems in mathematics courses, or working on your programming projects in computer science courses. Listening to your instructor, getting help from a tutor, and reading a book are all forms of *passive* learning. They all are important as introductory steps. However, the most productive way of *active* learning for you is to practice. Only through active learning, you will develop the necessary skills in your classes.

“Experience is that marvelous thing that enables you to recognize a mistake when you make it again.”

Franklin P. Jones.

Analysis of mistakes is a very important part of a learning process. Every time when you get back your graded papers, take a close look at each mistake that you made. Try to understand why you made it and how to eliminate the cause of such mistakes. If you have any questions about corrections, ask your instructor!

In a more general sense, there may be mistakes in organization of your preparation for classes. If you keep getting grades that are lower than you expect, usually it means that something is wrong with your preparation. Analyze your learning methods and think how to improve them. Ask your instructor what can be done in this direction. Nothing will become better without your efforts!

- *Time Management.*

“Nothing makes a person more productive than the last minute.”

Unknown.

Remember that different circumstances require different learning techniques. So-called brainstorming may be good for teamwork when finding a solution of a tricky problem under some kind of pressure, but it is bad for doing homework or preparing for the test. You may be able to finish your project a couple of minutes before the deadline, but it is very unlikely that you will remember well what you did in this project the very next day.

“Facts do not cease to exist because they are ignored.”

Aldous Huxley.

It is difficult to overestimate a number of failures that result from ignoring the following obvious fact: *a human brain is a biological object*. So, our brain works according to the laws of nature. In making plans for studying, we have to acknowledge that we CAN'T do whatever we want with our brain; actually, we can't do anything that contradicts the laws of biology and psychology; mostly, the psychology of learning. Get a good night's sleep, especially before tests, have a balanced diet and reserve some time for physical exercise. Study every day and review the material frequently (not only the night before the test!). It will help your brain to process information properly and move it to long-term memory without any losses. If you don't have much time at a particular day, at least find several minutes to look through your class notes and try to solve a couple of problems on the topic that was covered in the class. Do not assume that you will be able to make up the work later. If you miss a day, some information will be lost from your short-term memory, and you will have to apply much more effort to put it back. ***Studying every day saves time and effort!***

Also, remember to make short study breaks to let your mind refresh and convert short-term information into long-term information, otherwise you'll cram too much in and forget it all. It takes time and practice to figure out how best your brain learns, but once you know that, you can study productively,

- *Tests.*

“People see only what they are prepared to see.”

Ralph Waldo Emerson.

The very first and most important step in preparation for any test is doing homework every day. It may be a good idea to watch the time that you need to solve particular problems. Typically, a test will check not just how well you understand the material, but how **fluent** you are with tools that you studied in your class. You will have time restrictions during class quizzes and tests; prepare for this time frame while doing your homework.

Problems that are suggested for homework, discussed in the class, and included in test reviews are the kinds that are usually included on tests. Pay attention to what you are doing in the class and at home. Try to make sure that you clearly understand the material. Memorize important theoretical facts and types of the problems, as well as their methods of solution. If you develop a habit to do this constantly, you will need less time to review before tests. However, on the test you will never have the same exact problems that were discussed earlier. Pay attention to the ideas and algorithms.

Think about your strategy during tests. Usually, it is reasonable to start with simple problems. When you solve them, you will feel more confident and it will be easier to proceed with more complicated and time-consuming problems. Don't spend too much time on one problem; remember about time limitations! On the test, panic never helps. If you feel anxious, take several deep breaths and let them out slowly. Stay in control of your body and your mind.

- Resources.

“Confidence does not come from having all the answers; it comes from not being afraid to ask all the questions.”

Earl Stevens.

1. Lectures, notes, books are your first and most important resources. Your instructor does not have an opportunity to repeat the same material several times during the lecture. Please, listen carefully and take notes, so that later you will be able to go through this material yourself! If you have a question, keep listening. It may happen that your question will be answered in the next sentence. During the lecture, your instructor may reserve some time for taking students' questions. You will not forget your question if you make a mark on the side of your notes. Keep coming to the class even if you feel you fall behind. It will be easier for to catch up the material if you listen to your instructor and get your class notes.
2. Office hours. If you don't want to have a discussion with your instructor in the class, feel free to come during office hours. Don't be shy. It is natural to have questions and to bring them to your teacher. If the schedule of office hours is not convenient to you, make an appointment at another time.
3. Advising. You may get help from an academic advisor. Go to the web page of our department, then click on “Undergraduate Studies” and go either to “New Student Advising” or “Current Student Advising” to find who your advisor is.
4. Math Center and CS tutors. You may also bring your question to our tutors. Our department offers free tutoring in mathematics, as well as in some of the lower level computer science classes. You may find the schedule of tutoring in Computer Science on My Gateway, under ‘Computer Science Students’: go to ‘Tutoring’, and click ‘Physical Tutoring’. Also, check out some other resources that are available on My Gateway under the ‘Computer Science Students’ organization. You can find the Math Center schedule at http://umsl.edu/divisions/artscience/math_cs/math-academic-center/
5. Academic Advising and Student Retention Services. There is a team of professionals who know exactly what kinds of problems students may have in their life. Moreover, they know a lot of answers, too! You may be amazed to find a lot of useful information at <http://www.umsl.edu/services/css/> or <http://www.umsl.edu/services/srs/>
6. Counseling Services. If you have some persistent problems, you may find it useful to get assistance from counselors. Check their site <http://www.umsl.edu/services/counser/> to get more information.

Don't leave any questions unanswered!

We wish you the best of luck!