

# School of Science and Technology

# ITEC3600 Operating Systems,Spring 2023

## Instructor Information

**Instructor**: Dr.Umar Khokhar

**Office**: W-3260

**E-mail**: ukhokhar@ggc.edu

**Office phone**: 678-672-7636

**Teams softphone (mobile softphone, explained below**: 470-563-9676

### Communication

At any time, you can contact me by email, or by using the Teams softphone number above. The softphone is an add-on to Microsoft Teams which allows you to call or text me from a phone, as you call any other phone number. It allows me to receive calls and text messages in a variety of places, similar to using a cell phone. When you call my softphone number, you do not use Teams. Of course you can also call me or send messages using the Teams app.

Communications received Monday through Thursday after 5pm EST will be returned by the next day. On the weekend or when I am away from campus (e.g. at a conference), my response may be irregular.

You should check your GGC email every day. When corresponding by email, I will communicate with you using only your GGC email. Due to the Family Educational Rights and Privacy Act (FERPA), I will not respond to emails from other domains (yahoo.com, gmail.com, hotmail.com, etc.).

When you email me, you should consider the email as official correspondence. As such, the email should not appear as a text message but should have proper spelling, grammar, and punctuation.

You should also check your Brightspace (Desire2Learn) course site every day.

#### Technology Covenant

Technology will be used to deliver content, provide resources, assess learning, and facilitate interaction, both within the classroom and in the larger learning community. This covenant provides a general guideline for the course. I reserve the right to make periodic and/or necessary changes to the covenant, including technology use and communication channels, in order to accommodate the needs of the class as a whole and fulfill the goals of the course.

#### Expectations of Students

All students at GGC need to have access to a computer. If you do not have one, computer labs are available on campus. A limited number of laptops are available for checkout from the GGC Technology Helpdesk; please contact me about this if you need one.

Students can access the course materials and grades via Brightspace (Desire to Learn).

Students should check GGC email regularly (at least twice a day).

Cell phones should be set on silent and stowed during class.

Laptop computers should remain off, except when they are being used for an in-class activity or for taking notes.

All completed assignments will be submitted through Brightspace (Desire2Learn). Unless otherwise specified, daily assignments must be submitted prior to class time. Major projects are due by midnight on the due date unless other arrangements are made.

## Course Information

### Class Details

**Course Details**: [ITEC 3600, Section Number 2, and Credit Hours 3]

**Class Time**: T[6:30 pm – 9:15 pm]

**Course Location**: W-3201

## Course Information

### Class Details

Course Details: ITEC3600, 3 credit hours

### Course Description and Outcome Goals

### This course examines operating system design concepts, data structures and algorithms and systems programming basics. Upon completion of this course students will be able to 1) describe the structures and components of an operating system; 2) explain basic operating system concepts and functions, advantages and issues associated with virtualization; 3) implement short and long term CPU scheduling to control multitask programs; 4) illustrate operations of UI and able to implement simple interrupt handling in a context of UI; 5) implement multi-process and concurrent process programs utilizing process synchronization; 6) describe how file systems are organized and how files are managed in OS; 7) describe memory management strategies and how those strategies are implemented in OS.

### Course Prerequisites

### ITEC 2201 and ITEC 2150

### Course Resources

#### Required Texts

1. Operating System Fundamentals 1st edition by Umar Khokhar and Binh Tran (ALG Project 614)

URL: <https://ggc.view.usg.edu/d2l/le/content/2789300/viewContent/45300593/View>

#### Additional Resources

Window based laptop.

### Course Requirements and Grading

You can expect to access the course materials and grades via our course in Brightspace (Desire to Learn). Students should check this Brightspace regularly, as course changes will always be announced and recorded on the course site.

#### Grading Scale

A (Excellent) 90-100

B (Good) 80-89

C (Fair) 70-79

D (Poor) 60-69

F (Failure) 59 and below

#### Grading Percentages

| Grading Category | Percent Weight |
| --- | --- |
| Labs & Class Assignments | 20% |
| Quizzes | 45% |
| Project | 15% |
| Final Exam | 15% |
| Attendance | 5% |

#### Late Work Policy

#### Every effort should be made to hand all assignments and projects by the due date and time. Later submissions will be accepted, but will receive grade reduction.

#### Assessment Tools

Tests and quizzes **must be taken in the classroom**. Make up tests and quizzes will only be given due to extraordinary circumstances. Arrangements must be made in advance if an absence is anticipated.

### Course Outline/Assessments

| Week | Topics | Notes |
| --- | --- | --- |
| 1 | Syllabus; Ch\_1 (Introduction to Operating System (1/2) |  |
| 2 | Ch\_1 (1/2) Lab\_1 |  |
| 3 | Ch\_2 Operating System Structure |  |
| 4 | Ch\_2 Operating System Structure, Lab\_2 |  |
| 5 | Ch\_3 Processes, Lab\_3 |  |
| 6 | Ch\_3 Processes |  |
| 7 | Ch\_4 Threads, Lab 4 |  |
| 8 | Ch\_4 Threads |  |
| 9 | Ch\_5 Deadlocks, Lab\_5 |  |
| 10 | Ch\_6 Main Memory |  |
| 11 | Ch\_6 Main Memory (1/2) |  |
| 12 | Ch\_7 File Systems |  |
| 13 | Ch\_8 Clouds and Virtualization |  |
| 14 | Final Exam |  |

**Final Exam Details**

The final exam will be given during the first week of May. The date and time of the final exam is set by the registrar and will be posted at midterms. The exam schedule cannot be changed at the convenience of the student. You should not plan to be absent during that week. A make-up final exam will only be given in cases of a verifiable excused absence.

**Course Expectations**

**Attendance**

* Class attendance is taken at the beginning of the class. A student who arrives later than 10 minutes after the class started is considered absent.

**Class participation**

* Paying attention in class.
* Asking/answering questions.

**Some common sense notices**

* Please do not be late for classes or leave early.
* Please turn off all cell phones and other noisy electronic devices during class time.
* Please do not bring children, parents, friends, etc. into the class.
* Please avoid visiting websites unrelated to the class.
* Please show common courtesy to your fellow classmates and professor.

**Academic dishonesty**

Your work must be your own. Cheating will result in a grade of 0 for the applicable assignment; further disciplinary action, including assigning a failing grade (F) for the entire course may also be taken.

**Course Changes**

This course syllabus provides a general plan for this course. The instructor reserves the right to make changes to the syllabus, including changes to assignments, projects, examinations, etc., in order to accommodate the needs of the class as a whole and fulfill the goals of the course.

**Important Dates**

|  |  |
| --- | --- |
| Activity | Date |
| Tuition Due (Full Session and Session A) [Tuition and Fees Deadlines](https://www.ggc.edu/node/11616) | Jan. 10 |
| Classes begin (Full Session and Session A) | Jan. 17 |
| Drop/add ends (Session A) | Jan. 20 |
| Drop/add ends (Full Session) | Jan. 23 |
| Mid-term grades due (Session A) | Feb. 8 |
| Last day to withdraw with "W" (Session A) | Feb. 10 |
| Mid-term grades due (Full Session) | March 1 |
| Classes end (Session A) | March 2 |
| Final exams (Session A) | March 2-3 |
| Last day to withdraw with "W" (Full Session) | March 3 |
| Spring Break | March 5-12 |
| Tuition Due (Session B) [Tuition and Fees Deadlines](https://www.ggc.edu/node/11616) | March 7 |
| Classes begin (Session B) | March 13 |
| Drop/add ends (Session B) | March 16 |
| Apply to graduate deadline for Fall 2023 | April 1 |
| Mid-term grades due (Session B) | April 3 |
| Last day to withdraw with "W" (Session B) | April 5 |
| Classes end (Full Session and Session B) | May 1 |
| Final exams (Full Session and Session B) | May 2-8 |
| Grades due (Full Session and Session B) | May 10, 9 a.m. |
| Commencement | May 11 |
| Grades available in Grizzly Den within Banner | May 15 |

**School of Science and Technology**

**School Vision**

The School of Science and Technology will become recognized in the region and the state for excellence in STEM education at an open access institution. SST Faculty will provide effective and relevant courses and programs in science, math, and technology which are characterized by interdisciplinary learning, novel use of educational technology, and an active learning environment that stimulates critical thinking.

**School Policies**

**Class attendance and Financial Aid**

Please be aware that faculty check attendance in each of your courses and are required to report to the Registrar students who never attend or cease attending a course. Students who are reported as never attended or have ceased attending a course, Financial Aid will be notified and is required to adjust your financial aid award accordingly. If you have any questions about how not attending a course for which you are registered will affect your financial aid eligibility, please contact the Financial Aid Office.

**Make-up Exam Policy**

You are expected to attend every class. Failure to attend class will affect your grade.

Special arrangements to take a regular exam early must be made in advance in writing. Early exams are available only at the instructor’s discretion and only under extreme circumstances.

IF an emergency arises and you miss an exam you MUST notify me on the same DAY as the exam. Notification by email, text or phone message is acceptable. Any make-up work may have a different format or different content from the regular assignment. Make-up work should be completed within two days of the original due date. Work missed due to unexcused absences will be given a grade of zero.

Note: Lab Practical Exams CANNOT be rescheduled!

If you feel that you are unable to complete your courses due to illness or family emergency, contact the Registrar’s Office to attempt to withdraw from your courses without penalty.

**Final Exam**

The final exam will be given sometime during finals week as specified by the registrar. The date and time of the final exam is set by the Registrar and will be posted. The exam schedule cannot be changed at the convenience of the student. You should not plan to be absent anytime during that week. A make-up final exam will only be given in cases of a verifiable excused absence.

**Course Changes**

This course syllabus provides a general plan for this course. I reserve the right to make changes to the syllabus, including changes to assignments, projects, examinations, etc., in order to accommodate the needs of the class as a whole and fulfill the goals of the course.

**School/Program Outcomes**

**Integrated Educational Experience Goals:**

**The IEE Goals met by the objectives of this course are in bold/strong format:**

**IEE-1  Clearly communicate ideas in written and oral form.**

**IEE-2   Demonstrate creativity and critical thinking in inter- and multi-disciplinary contexts.**

**IEE-3   Demonstrate effective use of information technology.**

**IEE-4  Demonstrate an understanding of diversity and global perspectives leading to collaboration in diverse, global contexts.**

IEE-5   Demonstrate an understanding of human and institutional decision making from multiple perspectives.

**IEE-6   Demonstrate an understanding of moral and ethical principles.**

IEE-7   Demonstrate and apply leadership principles.

IEE-8   Demonstrate competence in quantitative reasoning.

**Student Resources**

**Academic Enhancement Center (AEC)**

The Academic Enhancement Center, located in W-1160, hosts several academic resources designed to help you achieve your goals. These resources include both in-person and virtual tutoring, as well as Peer Supplemental Instruction (PSI) peer-led study sessions and the CircleIn study app. To learn more about our services and hours, visit our website at https://www.ggc.edu/student.../academic-enhancement-center/ or call our front desk 678-407-5191.

**New Studying Resource: CircleIn**

GGC has made **CircleIn**, a virtual studying app/website, available to you and your classmates. Hop on a video call with classmates, create study groups, and share notes to prepare for success in your courses. Earn points and rewards for helping and collaborating with your classmates

**To get started** on your computer, phone, or other device, [download the app](https://qrco.de/bbe8X3?utm_source=hs_email&utm_medium=email&_hsenc=p2ANqtz--aJ8DhUmJW-uxW9b6awwHNw2H521N6rULhEAG3a4zVpHxIMl9DpCIEWSn0Mg3GXqxdEZdV) or visit the [app's desktop version](https://app.circleinapp.com/). Search Georgia Gwinnett College, enter your school login credentials, and select “Authorize” to get started.

**Counseling and Psychological Services (CAPS)**

CAPS is a safe, secure, and ***confidential*** space designed to support GGC students. Meeting with a CAPS clinician is a chance to explore issues and determine possible courses of action or resolution in a respectful and confidential setting.  Your mental health and wellness are our priority and we hope to help you succeed.

Your first step to starting your relationship with CAPS is to schedule an initial information-gathering appointment (Intake), where you meet with a clinician to discuss your needs. From here, a clinician will work with you to decide your next steps. Counseling is a collaborative effort that necessitates your willingness and commitment.

Counseling services are available for all currently-enrolled GGC students. Services are free to students and are offered year-round.

For more information, please visit [the CAPS website](https://www.ggc.edu/student-life/student-services/counseling-and-psychological-services/), or contact us at **678-407-5592**.

Also, for students who may need immediate support that cannot wait for a scheduled appointment, students have access to our **24/7 Support Line: 833-910-3366**.

**Dean of Students**

GGC's Dean of Students is an advocate and resource to support student success at GGC. The Dean has oversight for all [student affairs](https://www.ggc.edu/student-life/student-affairs/) areas. The Dean of Students can assist students in [crisis situations](https://www.ggc.edu/about-ggc/public-safety/in-an-emergency/student-crisis) including [food/home insecurities](https://www.ggc.edu/about-ggc/public-safety/public-health/faq/#emergency-funds), hospitalizations, medical issues and other issues related to health and safety. Your wellness matters! You can contact the Dean of Students at [tjimenez@ggc.edu](mailto:tjimenez@ggc.edu), [studentaffairs@ggc.edu](mailto:studentaffairs@ggc.edu) or **678-407-5882**.

**Disability Services**

***Access and Accommodations***: It is important to GGC that all students have equal access to the classroom and their educations. If you have already established accommodations with Disability Services, please provide me with your ***Faculty Accommodation Notification***, with your approved accommodations listed. Please do so at your earliest convenience, so we can discuss your needs in this course.

If you have not yet established services through Disability Services (located in **D-1404**), but have a permanent disability (such as but not limited to: mental health, attention-related, learning, vision, hearing, physical or health impacts), or temporary condition that requires accommodations, you are encouraged to meet with Disability Services. ***To contact disability services please call 678-407-5195 or send an email to*** [disabilityservices@ggc.edu](mailto:disabilityservices@ggc.edu)***.***

Disability Services offers resources and coordinates reasonable accommodations for students with disabilities and/or temporary health conditions. Reasonable accommodations are established through an interactive process requiring the student and disability services staff to meet. Disability services will review the documentation provided, discuss functional limitations with the student, along with the classroom environment and potential barriers or access issues. Georgia Gwinnett College is committed to creating an inclusive and accessible learning environments consistent with federal and state law.

**Kaufman Library**

The Daniel J. Kaufman Library and Learning Center provides a wealth of resources, services, and space, in support of your academic success. Tens of thousands of full text articles as well as e-books, e-book chapters, reports, statistics, streaming media, virtual anatomy and chemistry models, etc., are available from [library databases](https://libguides.ggc.edu/az.php)[, e-books](https://libguides.ggc.edu/az.php?t=13203), [e-journals](https://galileo-usg-ggc-primo.hosted.exlibrisgroup.com/primo-explore/jsearch?vid=GGC_V1&lang=en_US), and [media](https://libguides.ggc.edu/az.php?t=13201) collections covering a wide variety of subject areas. Books available at GGC and other USG institutions can be located in [GIL-Find, the library catalog](https://galileo-usg-ggc-primo.hosted.exlibrisgroup.com/primo-explore/search?tab=default_tab&vid=GGC_V1&sortby=rank&lang=en_US), and print books can be borrowed from other USG institutions. [Research and course guides](https://libguides.ggc.edu/) provide access to discipline specific databases, books, websites, etc. [Ask a Librarian](https://www.ggc.edu/academics/library/ask-a-librarian/) offers research assistance via chat, e-mail, phone, and walk-in. In-depth research assistance is available by [scheduling a research consultation](https://libcal.ggc.edu/appointments). Kaufman Library has individual and group study space throughout the building as well as 37 individual and group study rooms that can be booked via the [online reservation system](http://ggc.libcal.com/). There is a Quiet Reading Room located on the third floor. Computers, fully loaded with campus software, and printing are also available in Kaufman Library.

**Georgia Gwinnett College Policies**

**Academic Integrity**

Student Honor Statement: We will not lie, steal, or cheat, nor tolerate the actions of those who do.

Georgia Gwinnett College students are expected to adhere to the highest standards of academic integrity and are expected to encourage others to do the same. Further, students are expected to take responsible action when there is reason to suspect dishonesty on the part of others.

Academic dishonesty carries severe penalties ranging from a grade of “0” on the affected assignment to dismissal from Georgia Gwinnett College. Each faculty member at Georgia Gwinnett College bears the responsibility for assigning penalties for cases of academic dishonesty utilizing the faculty adjudication process. Please contact the Office of Student Integrity to report alleged violations of academic dishonesty. Students may appeal a penalty as outlined in the [Student Handbook](https://www.ggc.edu/student-life/student-affairs/_docs/current-student-handbook.pdf), Section 4.6.5, Student Code of Conduct.

**Academic Respect**

The college exists to foster educational excellence. To this end, a classroom atmosphere that supports learning must be maintained. Students are expected to be active, attentive participants in the class. Students are also expected to abide by class policies and procedures and to treat faculty and other students in a professional, respectful manner. Students are expected to be familiar with the [Student Handbook](https://www.ggc.edu/student-life/student-affairs/_docs/current-student-handbook.pdf), Section 4.6.5, Student Code of Conduct.

**Americans with Disabilities Act Statement**

Georgia Gwinnett College provides reasonable accommodation to employees, applicants for employment, students, and patrons who have physical and/or mental disabilities, in accordance with applicable statutes. Georgia Gwinnett College takes affirmative action to employ and advance in employment persons who are qualified disabled veterans, veterans of the Vietnam Era, or other covered veterans. If you are a student who is disabled as defined under the Americans with Disabilities Act and require assistance or support services, please seek assistance through the [Office of Disability Services](http://catalog.ggc.edu/content.php?catoid=1&navoid=22&hl=disabilities&returnto=search#disability-services). A CDS Counselor will coordinate those services.

For more information, refer to [GGC's web page on the ADA and Reasonable Accomodations](https://www.ggc.edu/community/diversity-equity-compliance/ada-and-reasonable-accommodations/).

**Attendance Policy**

The classroom experience is a vital component of the college learning experience. Interaction with instructors and with other students is a necessary component of the learning process. Students are expected to attend regularly and promptly all class meetings and academic appointments. Students who are absent from classes bear the responsibility of notifying their instructors and keeping up with class assignments in conjunction with instructor provisions in the course syllabus. An individual instructor bears the decision as to whether a student’s absence is excused or unexcused, and whether work will be permitted to be made up. The decision of the instructor in this case is final. Students who are absent because of participation in college-approved activities (such as field trips and extracurricular events) will be permitted to make up the work missed during their college-approved absences, provided that the student discussed with and obtained approval from the instructor to make up the work missed prior to the student's going on the field trip.

Individual instructors may establish additional attendance requirements appropriate to their course’s context, e.g. lab attendance. A student whose class schedule would otherwise prevent him or her from voting will be permitted an excused absence for the interval reasonably required for voting.

For more information, please refer to the [Student Attendance Policy](https://catalog.ggc.edu/content.php?catoid=33&navoid=4236#student-attendance-policy) in the GGC online catalog, [Academic Policies and Procedures](https://catalog.ggc.edu/content.php?catoid=33&navoid=4236).

**COVID-19 Statement**

When returning to campus for fall classes and activities proof of vaccination is not required but, please help to keep your fellow Grizzlies healthy and get fully vaccinated as soon as possible.  Vaccination locations can be found at <https://www.vaccines.gov/>

While on campus face masks are strongly encouraged for those who are not fully vaccinated.

Kindly do not enter GGC facilities if:

* You have signs or symptoms of the cold, flu, or COVID-19
* You have been diagnosed with a contagious illness and are still contagious
* You have had contact with a person that has or is suspected to have COVID-19 within the past 14 days and have not been fully vaccinated, are not immune, and have not completed the recommended post-exposure quarantine protocol.

For more information, please visit [GGC’s COVID-19 Health and Exposure Updates site](https://www.ggc.edu/about-ggc/public-safety/public-health/exposure).

**Respect for Diversity Statement**

It is my intent that students from all diverse backgrounds and perspectives be well served by this course, that students' learning needs be addressed both in and out of class, and that the diversity that students bring to this class be viewed as a resource, strength, and benefit. It is my intent to present materials and activities that are respectful of diversity: gender, sexuality, disability, age, socioeconomic status, ethnicity, race, and culture. Your suggestions are encouraged and appreciated. Please let me know ways to improve the effectiveness of the course for you personally or for other students or student groups.

**Equal Opportunity and Affirmative Action Statement**

Georgia Gwinnett College is an equal employment, equal access, equal educational opportunity, and affirmative action institution. It is the policy and practice of our institution to recruit, hire, train, promote, retain, and educate persons without regard to race, color, national or ethnical origin, age, disability, sex/gender, religion, sexual orientation, gender identity, genetic information, or veteran status as required by applicable state and federal laws (including Title VI, Title VII, Title IX, ADA, Sections 503 and 504 of the Rehabilitation Act, and Executive Order 11246 ).

Additionally, Georgia Gwinnett College affirms its commitment to keeping its workplace and academic programs free of discrimination and harassment, and maintaining an environment that recognizes the inherent worth and dignity of every person. Any individual who feels that they may have been discriminated against, should contact the Office of Diversity & Equity Compliance at [odec@ggc.edu](mailto:odec@ggc.edu).

Students requiring disability related accommodations, please contact the Office of Disability Services at [disabilityservices@ggc.edu](mailto:disabilityservices@ggc.edu).

For more general information, please visit the [Office of Diversity and Equity Compliance’s](https://www.ggc.edu/community/diversity-equity-compliance/) website.

**Safety and Security**

View the [GGC Safety and Emergency Communications web page](http://www.ggc.edu/about-ggc/public-safety/safety-and-emergency-communications/) for information important to you. To avoid confusion and rumor, ensure you:

1. Sign up for [RAVE alert text notification](https://www.getrave.com/login/ggc).
2. Download the LiveSafe app for [iPhone](https://itunes.apple.com/us/app/livesafe/id653666211?ls=1&mt=8) or [Android](https://play.google.com/store/apps/details?id=com.livesafe.activities&hl=en).
3. View the 15-minute [Active Shooter Video](https://media.ggc.edu/media/t/1_z4itrq86). You are the additional eyes and ears for first responders. Follow the adage, “If you see something, say something” to a GGC employee. Your community needs your increased vigilance and awareness.
4. For updates on COVID-19 please visit [our COVID-19 Public Health page](https://www.ggc.edu/about-ggc/public-safety/public-health/). It includes links to the latest information from the Centers for Disease Control and Prevention (CDC), the World Health Organization (WHO), and the University System of Georgia (USG), among others.

**Sexual Misconduct Statement**

Georgia Gwinnett College is committed to providing a learning, working and living environment that promotes personal integrity, civility, and mutual respect, and is free of all forms of sex discrimination, including sexual harassment, nonconsensual sexual contact, nonconsensual sexual penetration, sexual exploitation, domestic violence, dating violence, and stalking. If you or someone you know is experiencing any of these behaviors, the College has staff and resources on campus to support and assist you. For a list of resources, please visit [Sexual Misconduct Resources](https://www.ggc.edu/community/diversity-equity-compliance/title-ix/sexual-assault-prevention-resources/).

### There are both confidential and non-confidential resources and reporting options available to you. GGC is legally obligated to respond to reports of sexual misconduct, and therefore we cannot guarantee the confidentiality of a report, unless made to a confidential resource. Responses may vary from support services to formal investigations. As a faculty member, I am required to report incidents of sexual misconduct and thus cannot guarantee confidentiality. I must provide our Title IX Coordinator with relevant details such as the names of those involved in the incident. For more information about policies and resources or reporting options, please visit the [website of the Office of Diversity and Equity Compliance](https://www.ggc.edu/community/diversity-equity-compliance/)