Department of Information Sciences and Technology

IT 314: Database Programming

Course Syllabus

Spring 2021

This syllabus contains information common to all sections of IT 314 for this semester. For each section, a customized syllabus with information specific to that section will be made available to registered students via the Blackboard Learning System.

Logistics

Detailed information on all IT 314 sections offered in this semester including the day, time, location, instructors’ names and their contact information is available through the Schedule of Classes posted on PatriotWeb.

Course Description

| IT 314 Database Programming (3:3:0) |

Prerequisite(s): Grade of C or better in (IT 106 or IT 196 or CS 112), and grade of B or better in (IT 214 or IT 194).

The course introduces students to the Oracle Developer application development utilities and tools and describes how to create and manipulate databases in Oracle database management system. The course provides an extensive overview of SQL and introduction to PL/SQL. Topics include data definition and manipulation languages, stored procedures, triggers, indexing techniques, and elementary query optimization.

From http://catalog.gmu.edu/
Prerequisites

The prerequisite for this course is grade of C or better in (IT 106 or IT 196 or CS 112), and grade of B or better in (IT 214 or IT 194). The prerequisite courses must be completed prior to, not concurrently with, this course.

This requirement will be strictly enforced. Any student who does not meet the prerequisite requirement will be dropped from the course by the Instructor at the start of the semester and the student will be responsible for any consequences of being dropped.

Rationale

Databases provide a convenient means of storing large amounts of data, allowing it to be sorted, searched, viewed, and manipulated according to the business needs and goals. Many companies rely so heavily on the functions of databases that their daily business operations cannot be executed if databases are unavailable, making database management and maintenance a vital component of their business models. This course is intended to develop understanding of database management, introduce students to currently available technologies and tools, and examine typical applications of those technologies to real-world problems.
**Program Level Student Outcomes**

On successful completion of this course, students will be able to:

- Analyze a complex computing problem and apply principles of computing and other relevant disciplines to identify solutions.
- Design, implement, and evaluate a computing-based solution to meet a given set of computing requirements in the context of the program’s discipline.
- Identify and analyze user needs and to take them into account in the selection, creation, integration, evaluation, and administration of computing-based systems.

**Course Student Outcomes**

On successful completion of this course, students will be able to:

- Create database objects, including tables, constraints, indexes, sequences, synonyms, and users, and manipulating data
- Effectively apply data query techniques, such as row filtering, joins, single-row functions, aggregate functions, sub-queries, and views
- Be proficient with advanced query topics, such as ROLLUP, CUBE, and TOP-N analysis
- Demonstrate solid understanding of fundamental PL/SQL concepts
- Be able to apply effectively advanced PL/SQL and SQL topics, such as dynamic SQL and compound triggers, as well as important developments in bulk processing, PL/SQL compiler features, and hiding source code

**Topics**

- Overview of Database Concepts
- Basic SQL SELECT Statements
- Table Creation and Management
- Constraints
- Data Manipulation and Transaction
- Restricting Rows and Sorting Data
- Joining Data From Multiple Tables
- Selected Single-Row Functions
- Group Functions
- Sub-queries and MERGE Statement
- Additional Database Objects
- Basic PL/SQL Block Structures
- Cursors and Exception Handling
- Procedures, Functions, Packages
- Database Triggers
- Views
References

Textbooks

There are two required textbooks for this course:

Textbook 1:

- ISBN-10: 1305251032

Textbook 2:

Oracle 11g: PL/SQL Programming by J. Casteel

Publisher: Cengage Learning
Edition: 2 (September 12, 2012)
Language: English
ISBN-10: 1133947360
Faculty and Staff

IT 314 Instructors:

**Prof. Amir Tofighi**  
Email: atofighi@gmu.edu  
Office hours: TBA

**Prof. Valeriy Pavlenko**  
Email: vpavlen2@gmu.edu  
Office hours: TBA

Teaching Assistant:  
TBA

Administrative support:

**Fairfax campus** and **Prince William campus**

Xin Tian Saunders  
**Engineering Building**, 5400  
Phone: 703-993-1695
Grading

Grades will be awarded in accordance with the Mason Grading System for undergraduate students. See the university catalog for policies: http://catalog.gmu.edu for more information.

The grading scale for this course is:

<table>
<thead>
<tr>
<th>Percentage</th>
<th>Grade</th>
</tr>
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<tbody>
<tr>
<td>97 – 100%</td>
<td>A+ Passing</td>
</tr>
<tr>
<td>93 – 96%</td>
<td>A Passing</td>
</tr>
<tr>
<td>90 – 92%</td>
<td>A- Passing</td>
</tr>
<tr>
<td>87 – 89%</td>
<td>B+ Passing</td>
</tr>
<tr>
<td>83 – 86%</td>
<td>B Passing</td>
</tr>
<tr>
<td>80 – 82%</td>
<td>B- Passing</td>
</tr>
<tr>
<td>77 – 79%</td>
<td>C+ Passing</td>
</tr>
<tr>
<td>73 – 76%</td>
<td>C Passing</td>
</tr>
<tr>
<td>70 – 72%</td>
<td>C- Passing*</td>
</tr>
<tr>
<td>60 – 69%</td>
<td>D Passing*</td>
</tr>
<tr>
<td>0 – 59%</td>
<td>F Failing</td>
</tr>
</tbody>
</table>

* Grades of "C-" and "D" are considered passing grades for undergraduate courses. However, a minimum grade of "C" is required in the BSIT program for any course that is a prerequisite for one or more other courses. This course is a prerequisite for several courses in BSIT Concentrations – see http://www.gmu.edu/catalog/courses/it.html for more information on those courses.

Raw scores may be adjusted by the Instructor to calculate final grades.

Students are responsible for checking the currency of their grade books. Grade discrepancies must be brought to instructor’s attention within one week of assignment submission and 48 hours of exam submission.

Final grades will be determined based on the following components:

<table>
<thead>
<tr>
<th>Category</th>
<th>Percentage</th>
</tr>
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<tbody>
<tr>
<td>Quizzes</td>
<td>10%</td>
</tr>
<tr>
<td>Practice Problems</td>
<td>15%</td>
</tr>
<tr>
<td>Hands-On Assignments</td>
<td>20%</td>
</tr>
<tr>
<td>Midterm 1</td>
<td>25%</td>
</tr>
<tr>
<td>Final Exam</td>
<td>30%</td>
</tr>
</tbody>
</table>

Exams for both in-class sections and on-line sections will be administered on campus during scheduled days and times. Exams will be conducted in person, but using the Blackboard web site.
You will be required to present photo ID. Your Mason student ID is preferred, but a driver's license will also be accepted. You will not be permitted to take an exam without your photo ID.

Quizzes, Practice Problems, and Hands-On Assignments

Quizzes, Practice Problems, and Hands-On Assignments will be assigned every week during the semester. Each assignment is to be prepared and submitted as specified by the Instructor. Late assignments may not be accepted – if accepted, a penalty may be applied. Acceptance of late assignments and/or application of penalties will be at the sole discretion of the Instructor.

Mid-term exam

Mid-term exam 1 will be conducted during week 7 and will be based on topics addressed in Classes 1-6. The mid-term exam will be “closed book” – no reference materials other than those provided with the exam paper will be permitted.

Final exam

The final exam will be held during the scheduled final exam session (see http://registrar.gmu.edu) and will be based on topics addressed throughout the entire course. The final exam will be “closed book, closed notes” – no reference materials other than those provided with the exam paper will be permitted. Final exams will be retained by the Department of Information Sciences and Technology and will not be returned to students.

No make-up for any activity including exams, unless arranged in advance. Only in special cases, such as medical problems and family emergency, make-ups and late assignments may be allowed with verifiable proof. Arrive promptly to exams. Late students may not be admitted.

Final grades will be posted to PatriotWeb, which is the only vehicle for students to obtain those grades. A student with a "hold" on his/her PatriotWeb account will be unable to access final grades until the hold has been removed by the Registrar.

Schedule

A detailed schedule will be published on Blackboard. As many factors may affect the development and progress of a class, the instructor reserves the right to alter the schedule as may be required to assure attainment of course objectives. The schedule is subject to revision before and throughout the course.

Registered students should see the Blackboard Learning System for the latest class schedule.

Important Dates

Dates for dropping, adding the course etc. are available via http://registrar.gmu.edu/calendars/
Religious Holidays

A list of religious holidays is available on the University Life Calendar page. Any student whose religious observance conflicts with a scheduled course activity must contact the Instructor at least 2 weeks in advance of the conflict date in order to make alternative arrangements.

Attendance Policy

Students in in-class sections are expected to attend each class, to complete any required preparatory work and to participate actively in lectures, discussions and exercises. As members of the academic community, all students are expected to contribute regardless of their proficiency with the subject matter.

Students are expected to make prior arrangements with Instructor if they know in advance that they will miss any class and to consult with the Instructor as soon as possible if they miss any class without prior notice. Any student who expects to miss more than one class session is strongly advised to drop the course and take it in a later semester when he/she can attend every class.

Departmental policy requires students to take exams at the scheduled time and place, unless there are truly compelling circumstances supported by appropriate documentation. Except in such circumstances, failure to attend a scheduled exam will result in a score of zero (0) for that exam, in accordance with Mason policy on final exams. Students should not make travel plans or other discretionary arrangements that conflict with scheduled classes and/or exams. If the University is closed due to weather or other unforeseen conditions, final exams may be rescheduled – students are strongly advised not to make plans that would prevent them from attending exams that may be rescheduled during the entire exam period.

NET Version attendance: During each week the students must perform all the requirements published for that week. A detailed week-by-week schedule of classes will be published on the net version of the course.

Classroom conduct

Students are expected to conduct themselves in a manner that is conducive to learning, as directed by the Instructor. Any student who negatively impacts the opportunity for other students to learn will be warned – if disruptive behavior continues, the student will be asked to leave the classroom.

Electronic devices are potential distractions in the classroom environment. Cell phones, pagers and other handheld devices must be turned off or set to "silent" mode and not used while class is in session. Laptop computers and similar devices may be used only if such use is directly related to the classroom activity in progress – for some activities the Instructor may require that such devices not be used in order to maximize student engagement.
Communications

Registered students will be given access to a section of the Blackboard Learning System for this course. Blackboard will be used as the primary mechanism (outside of lectures) to disseminate course information, including announcements, lecture slides, homework and other assignments, and scores for homework and exams.

Communication with the Instructor on issues relating to the individual student should be conducted using Mason email, via telephone, or in person - not in the public forums on Blackboard. Mason Mail is the preferred method – for urgent messages, you should also attempt to contact the Instructor via telephone. Federal privacy law and Mason policy require that any communication with a student related in any way to a student's status be conducted using secure Mason systems – if you use email to communicate with the Instructor you MUST send messages from your Mason email account.

When sending an e-mail to the instructor, please include the following:

- Course number
- Section number
- Your full name

Privacy

Instructors respect and protect the privacy of information related to individual students.

As described above, issues relating to an individual student will discussed via email, telephone or in person. Instructors will not discuss issues relating to an individual student with other students (or anyone without a need to know) without prior permission of the student.

Assessable work other than final exams will be returned to individual students directly by the Instructor (or by a faculty or staff member or a Teaching Assistant designated by the Instructor, or via another secure method). Under no circumstances will a student's graded work be returned to another student.

Faculty and staff will take care to protect the privacy of each student's scores and grades.

Disability Accommodations

The Office of Disability Services (ODS) works with disabled students to arrange for appropriate accommodations to ensure equal access to university services. Any student with a disability of any kind is strongly encouraged to register with ODS as soon as possible and take advantage of the services offered.

Accommodations for disabled students must be made in advance – ODS cannot assist students retroactively, and at least one week's notice is required for special accommodations related to exams. Any student who needs accommodation should contact the Instructor during the first week of the semester so the sufficient time is allowed to make arrangements.
Honor Code

All members of the Mason community are expected to uphold the principles of scholarly ethics. Similarly, graduating students are bound by the ethical requirements of the professional communities they join. The ethics requirements for some of the communities relevant to IST graduates are available via the following links:

- ACM Code of Ethics and Professional Conduct
- IEEE Code of Ethics
- EC-Council Code of Ethics

On admission to George Mason University, students agree to comply with the requirements of the Mason Honor System and Code. The Honor Code will be strictly enforced in this course. Honor Code cases are heard by a panel consisting of students – students who meet the requirements are encouraged to nominate themselves to serve on the Honor Committee.

Any use of the words or ideas of another person(s), without explicit attribution that clearly identifies the material used and its source in an appropriate manner, is plagiarism and will not be tolerated. The Instructor reserves the right to use manual and/or automated means (including such services as SafeAssign.com) to detect plagiarism in any work submitted by students for this course, and to direct Teaching Assistants and/or other faculty and/or staff members to do likewise in support of this course.

For this course, the following requirements are specified:

- All assessable work is to be prepared by the individual student, unless the Instructor explicitly directs otherwise.

- All work must be newly created by the individual student for this course for this semester.
  Any usage of work developed for another course, or for this course in a prior semester, is strictly prohibited without prior approval from the instructor.

Students may seek assistance with assigned work (and are encouraged to do so if they feel the need), provided:

- The directions for the assigned work do not prohibit such assistance.

- Such assistance is acknowledged in the submitted work, clearly identifying the person(s) giving assistance and the nature of the assistance given.

- Any work to be submitted is prepared entirely an exclusively by the student submitting it. Students are expressly prohibited from sharing any assessable work for this course in any manner with other students (except students assigned as Teaching Assistants or Undergraduate Peer Mentors to this course and the student's section), unless all students involved have had their work graded and returned by the Instructor, or the Instructor has explicitly approved such sharing.
Gender identity and pronoun use

If you wish, please share your name and gender pronouns with me and how best to address you in class and via email. I use “he/him/his” for myself and you may address me as just “Professor” “Prof. Amir”, “Prof. Tofighi”, “Mr. Amir” or “Mr. Tofighi” in email and verbally.

Anti-Racism

As a member of the George Mason University community, the Volgenau School of Engineering plays an integral role in building an educational environment that is committed to anti-racism and inclusive excellence. An anti-racist approach to higher education acknowledges the ways that individual, interpersonal, institutional, and structural manifestations of racism against Black individuals and other people of color contribute to inequality and injustice in our classrooms, on our campuses, and in our communities, and it strives to provide our community members with resources to interrupt cycles of racism so as to cultivate a more equitable, inclusive, and just environment for all of our students, staff, faculty, alumni, and friends, regardless of racial background.

To be anti-racist means:

- To make constant, conscious decisions to interrupt racism and cultivate equity, inclusion, and justice for people of all racial backgrounds, and in particular those from Black communities and other communities of color, who are most likely to bear the direct and indirect costs of systems of white supremacy;
- To interrogate histories of white supremacy and white-dominant culture, and to examine the ways in which these histories have impacted our individual beliefs, our interpersonal relationships, our institutional and structural policies and processes, and our entire society;
- To make a commitment to being responsible for our own relationships to, and actions within, systems of white supremacy; and
- To cultivate a practice of self-awareness and self-reflection that allows us to critically evaluate our own role in upholding white supremacy and identify the ways we can interrupt cycles of racism at the individual, interpersonal, institutional, and structural levels.

We believe that the work of anti-racism starts with each individual, and that in cultivating an anti-racist approach to research, scholarship, and practice, our students will build a skillset rooted in principles of equity, inclusion, and justice that they will carry with them throughout their lives.

For more information on how to continuously cultivate the practice of anti-racism, see this guide from the National Museum of African American History and Culture on how to be anti-racist: https://nmaahc.si.edu/learn/talking-about-race/topics/being-antiracist