**Graduate Deficiency Course CS5101-0001**

**Discrete Structures (1 credit hour) - Spring 2019**

**School of Computing and Engineering**

**University of Missouri – Kansas City**

**General:**

Class meets: Friday 9:00 AM – 12:00 PM

Class room: Royall hall - Rm 211

Office hours: Every Tuesday 11:00 AM to 12:00 PM or by appointment

Office room: 455 Flarsheim Hall

E-mail: fjmb7@mail.umkc.edu

Class Dates: 01/22/2019 – 03/16/2019

**Course Description:**

Mathematical logic, sets, functions, mathematical induction, algebraic structures with emphasis on computing applications, basics of algorithms, relations, counting.

**Course Objective:**

Discrete Math plays a critical role in Computer Science/Information Technology. The goal is to show and to understand basic knowledge and use of Discrete Math in CS/IT as well as to prepare you for taking higher-level CS/IT courses. I’ll also discuss how these seemingly unrelated topics are connected somehow to real-world computer science problems.

Material we will cover in this class includes the following topics:

**General Topics**

* Introduction, Sets, Set Operations
* Propositions
* Conditional Proposition, Equivalence, Rule of Inference
* Predicates and Quantifiers
* Proofs
* Functions
* Mathematical Induction
* Integers and Divisors
* Integers and Algorithms
* Euclidean Algorithm
* Relations, Equivalence Relations, partial ordering
* Closure of Relations, Matrix of Relations

**Graphs**

* Graph Definitions
* Hamiltonian and Euler cycles
* Shortest Path Algorithms
* Representations of Graphs
* Isomorphisms
* Planar Graphs
* Graph Coloring

**Trees**

* Terminology and Characterizations of Trees
* Spanning Trees
* Minimal Spanning Trees
* Binary Trees
* Tree Traversals
* Decision Trees
* Isomorphisms of Trees
* Game Trees

**Automata, Grammars, and Languages**

* Sequential Circuits and Finite-State Machines
* Finite-State Automata
* Languages and Grammars
* Relationships between Languages and Automata
* Turing Computability

**Course Material:**

**Textbook:** R. Johnsonbaugh, *Discrete Mathematics*, 7th Edition, Prentice all, 2008 (ISBN:  978-0-13-159318-3)

**Assessments and Grading:**

Assignments- 20%

Presentation – 20%

Quiz - 10%

1st exam - 25%

Final exam - 25%

**Grading Scale:**

A: 90%

A- : 85%

B+: 80%

B: 75%

B- : 70%

C+: 65%

C: 60 %

**Policies on Attendance and Participation:**

Students are expected to attend *all* classes. If you can’t attend for some reason, inform me ahead of time. *Active participation and professionalism in class is expected during class.*- Bring your notes.

- Turn off your cell phone or put it on vibration or silent mode during class.

- Do not use your laptop computer during class unless you are using it for class note taking purpose.

- Ask questions and be respectful to others.

**NOTE:** This syllabus is subject to change during the semester. The change will be announced in class as well as on Blackboard whenever possible.

**Course Policies**

* **Class Attendance**

Class attendance is highly recommended. There is no explicit penalty for missing a class meeting, but missing too many class meetings may affect your grade. The instructor may take attendance in every class meeting and make a judgement.

* **Homework**

Homework will be posted to Black Board and students will be notified via E-mail when assignments have been posted. However, students are advised to regularly check the Blackboard to ensure that assignment due dates are not missed. Delayed homework submission will be denied unless approved by instructor for a good reason.

* **Makeup exams**

No makeup test will be given for the purpose of improving your score. However, if you miss an exam for a good reason, make-up exams will be administered on a case-by-case basis. To determine a reason is good or not, a rule of thumb is that involuntary absences such as serious illness, injury or academic conflict are more likely to be excused. Voluntary absences such as participating in a wedding of your best high-school friend or going to Chief's football weekend are not likely to be excused. Also, you should not argue for the score from the makeup test simply because a different set of problems is used.

* **Academic Dishonesty**

Any assigned work, including homework, is expected to be original. If sources are used in written assignments, they must be acknowledged in footnotes or bibliography. Even if projects or homework is team-based, it still must be original work. Academic dishonesty is clearly spelled out in the UMKC General Catalog under the Student Code of Conduct. Academic dishonesty in this course will be governed by these definitions.

Students observed cheating on exams will, at a minimum, be awarded a zero for the question and may receive a zero for the entire exam. Names of persons involved in any of these incidents will be forwarded to the campus Primary Academic Dishonesty Coordinator. Those students will be subject to sanctions as outlined in the general catalog. Sanctions may be as serious as expulsion from the University.

* **Counseling and Health Services Available at UMKC**

UMKC students may experience many challenges in their lives while attending college, stress, depression, suicidality, trauma, relationship issues, health concerns, etc. As your professor I care about your success and well-being, and want to make you aware of some helpful resources on campus. The UMKC Counseling Center (www.umkc.edu/counselingcenter), located at 4825 Troost in Room 206, offers a wide range of supportive services to students. Appointments can be made by calling 816.235.1635. UMKC Student Health and Wellness (<http://info.umkc.edu/studenthealth/>), located at 4825 Troost in Room 115, offers a full range of health care and promotion services. Appointments can be scheduled online or by calling 816.235.6133. The MindBody Connection (www.umkc.edu/mindbody) is located in the Atterbury Student Success Center in Room 112 and offers a variety of stress-reduction services.

* **Disability Support Services**

To obtain disability related accommodations and/or auxiliary aids, students with disabilities must contact the Office of Services for Students with Disabilities (OSSD) as soon as possible. To contact OSSD, call (816) 235-5696. Once verified, OSSD will notify the course instructor and outline the accommodation and/or auxiliary aids to be provided. For more information go to: <http://www.umkc.edu/disability/>.

* **UMKC Connect**

Important information is available to students in UMKC Connect accessed through Blackboard. Throughout the term, students may receive emails regarding course grades or academic performance. Students are expected to address information posted in a timely fashion. This information may be shared with the student's Success Network made up his or her academic advisor(s) and other campus resources so that UMKC may fully support the students’ success.