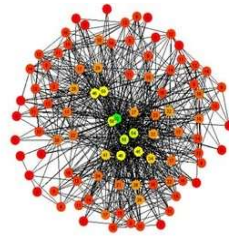# Fall 2018 Semester
COMP SCI 6001-1B: Applied Graph Theory for Computer Science

Class Hours: T 4:00-6:30 PM
Venue: Comp Sci 209
Office Hours: T 2:00-3:00 PM

Instructor: *Prof. Sajal K. Das*
315 Computer Science Building
sdas@mst.edu

"... pleasure has probably been the main goal all along. But I hesitate to admit it, because computer scientists want to maintain their image as hard-working individuals who deserve high salaries. Sooner or later society will realize that certain kinds of hard work are in fact admirable even though they are more fun than just about anything else."

– Donald E. Knuth (Computer Scientist, Turing Award Winner, 1974)

"Education is the manifestation of the perfection already in man." – Swami Vivekananda (1863-1902)

"A teacher can never truly teach unless he is still learning himself. A lamp can never light another lamp unless it continues to burn its own flame. The teacher who has come to the end of his subject, who has no living traffic with his knowledge but merely repeats his lesson to his students, can only load their minds, he cannot quicken them".

– Rabindranath Tagore (1861-1941), Indian Nobel Laureate Poet (1913)

Course Description:

Graphs offer excellent modeling and analysis tools for solving a wide range of real-life problems in engineering and computer science that include the Internet, wireless and sensor networks, mobile computing, social networks, distributed computing architectures, VLSI, scheduling, bioinformatics, image processing, databases and data mining, machine learning, big data, Internet of Things (IoT), and so on.

This foundational course deals with basic and advanced concepts in graph theory. Emphasis will be on given on understanding the underlying concepts, theory, and proof techniques and how to develop "cool" and "elegant" solutions for real-life applications. Students will be engaged in research projects.

Topics include, but are not limited to:

- Combinatorial principles
- Undirected and directed graphs
- Connected and disconnected graphs
- Enumeration of trees
- Graph planarity
- Network topology design

- Hamiltonian cycles and Euler tours
- Node and edge coloring
- Graph matching
- Network flow problems
- Random graphs
- Real-life applications of graphs

Textbook: Douglas B. West, *Introduction to Graph Theory*, Prentice Hall, 2nd edition, 2001.

Prerequisites: COMP SCI 2500 or CS 5200 or MATH 5107 or consent of the instructor. More importantly, a problem solving and creative mind!

Grading Policy:

Two Exams (Midterm + Final)	40% of total grade
HW Assignments	30% of total grade
Research Project + Presentations	30% of total grade
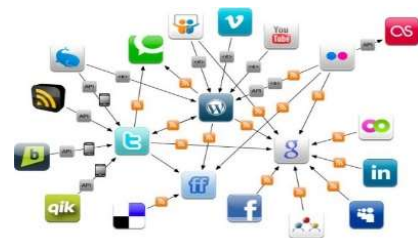
Anne Helmond, May 2009

Course Policies

Academic Alert System
The purpose of the [Academic Alert System](#) is to improve the overall academic success of students by improving communication among students, instructors and advisors; reducing the time required for students to be informed of their academic status; and informing students of actions necessary by them in order to meet the academic requirements in their courses.

Disabilities
If you have a documented disability and anticipate needing accommodations in this course, you are strongly encouraged to meet with the instructor as early as possible in the semester. You will need to request that the [Disability Support Services](#) staff send a letter to the instructor verifying your disability and specifying the accommodation you will need before the instructor can arrange your accommodation. Disability Support Services is located in 203 Norwood Hall, their phone number is 341-6655, and their E-mail is dss@mst.edu.

Academic Dishonesty
Every student enrolled in this course is expected to be familiar with [Missouri S&T's Student Academic Regulations](#), including the section on *Conduct of Students* which on pages 27-28 defines several forms of *Academic Dishonesty* such as *cheating*, *plagiarism*, and *sabotage*. Incidences of Academic Dishonesty will typically result in zero grades for the respective course components, notification of the student's advisor, the student's department chair, and the campus undergraduate/graduate studies office, and further academic sanctions may be imposed as well in accordance with the regulations. Note that those who allow others to copy their work are just as guilty of plagiarism and will be treated in the same manner.