COURSE SYLLABUS
MTH 673.01: Applied Analysis
Fall 2007 (3 credit hours)

Meeting Time/Place: MWF 11:00 -- 11:50/ LDB 201
Instructor: Dr. Jianzhong Wang
Office/Phone: LDB 417D **/** 294-3521
E-mail/Web: jzwang@shsu.edu / www.shsu.edu/~mth_jxw
Office Hours: MW 10:00-11:00, TT 11:00-12:00. If these times are inconvenient for you, please call and make an appointment at another time. You can also use the blackboard on school Web to submit your questions

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Textbook: *Advanced Calculus, Third Edition,* R. C. Buck, (Selected Sections)

Objective: The purpose of the course is to introduce students to the fundamental concepts and standard theorem of analysis and the reading ability for mathematical literature on their own. Another goal of the course is to develop the skills of students in presenting mathematical ideas, concepts, and proofs to audience.

Description: Topics include algebraic and topological structure of Euclidian space, differentiation of transformation, and high-dimensionality reduction.

Assignments, Lectures, and Presentations: The course contains several student activities. Each student is required to complete written assignments, to read certain sections and then to give lectures on class meetings. There are two tests and a final oral presentation for the course.

Grade: The assignments of homework count 25%, lectures count 25%, two tests count 15% and the final presentation counts 20%. No extra credit can be earned for this course. The following is for each letter grade: A 90-100%, B 80-89%, C 70-79%, D 55-69%, F 0-54%.

Academic Dishonesty: All students are expected to engage in all academic pursuits in a manner that is above reproach. Students are expected to maintain complete honesty and integrity in the academic experiences both in and out of the classroom. Any student found guilty of dishonesty in any phase of academic work will be subject to disciplinary action at the discretion of the instructor. The University and its official representatives may initiate disciplinary proceedings against a student accused of any form of academic dishonesty including, but not limited to, cheating on an examination or other academic work which is to be submitted, plagiarism, collusion and the abuse of resource materials.

Students with Disabilities: It is the policy of Sam Houston State University that no otherwise qualified disabled individual shall, solely by reason of his/her handicap, be excluded from the participation in, be denied the benefits of, or be subjected to discrimination under any academic or Student Life program or activity. Disabled students

may request assistance with academically related problems stemming from individual disabilities by contacting the Director of the Counseling Center in the Lee Drain Annex or by calling (936) 294-1720. Please bring all the necessary paperwork to the instructor before the end of the first week of classes in order to proceed with the requested accommodations. All disclosures of disabilities will be kept strictly confidential. NOTE: no accommodation can be made until you register with the Counseling Center.

Classroom Rules of Conduct: Students will refrain from behavior in the classroom that intentionally or unintentionally disrupts the learning process and, thus, impedes the mission of the university. Cellular telephones and pagers must be turned off before class begins. Students are prohibited from eating in class, using tobacco products, making offensive remarks, reading newspapers, sleeping, talking at inappropriate times, wearing inappropriate clothing, or engaging in any other form of distraction. Inappropriate behavior in the classroom shall result in a directive to leave class. Students who are especially disruptive also may be reported to the Dean of Students for disciplinary action in accordance with university policy.

Observation of Holy Days: Section 51.911(b) of the Texas Education Code requires that an institution of higher education excuse a student from attending classes or other required activities, including examinations, for the observance of a religious holy day, including travel for that purpose. A student whose absence is excused under this subsection may not be penalized for that absence and shall be allowed to take an examination or complete an assignment from which the student is excused within a reasonable time after the absence.
University policy 861001 provides the procedures to be followed by the student and instructor. A student desiring to absent himself/herself from a scheduled class in order to observe (a) religious holy day(s) shall present to each instructor involved a written statement concerning the religious holy day(s). This request must be made in the first fifteen days of the semester or the first seven days of a summer session in which the absence(s) will occur. The instructor will complete a form notifying the student of a reasonable timeframe in which the missed assignments and/or examinations are to be completed.

Course Schedule: The course schedule and the scheduled test dates are tentative and may be subject to revision.

Date	Section	Topics covered
08/20		**First-day class**
08/22	1.2 , 1.3	Vector Space and Euclidian Space **(Student Lecture)**
08/24	1.5	Topological Structure in R^n **(Student Lecture)**
08/27	1.6	Sets and Sequences
08/29	1.6-1.7	Cauchy Sequences **(Student Lecture)**
08/31	1.7	Bolzano-Weierstrass Theorem in R
09/5	1.8	Heine-Borel Theorem in R
09/7	Ch 1	Bolzano-Weierstrass in R^n **(Student Lecture)**
09/10	Ch 1	Heine-Borel Theorems in R^n **(Student Lecture)**
09/12	Ch 2	Limit, Continuity, and Uniformly Continuity (I)
09/14	Ch 2	Limit, Continuity, and Uniformly Continuity (II)
09/17	Ch 3	Partial Derivative and Differentiation (I)
09/19	Ch 3	Partial Derivative and Differentiation (II)
09/21	Ch 3	Hessian Matrix and Taylor's Theorem
09/24		Review 1
09/26		**Test 1**
09/28	7.1-7.2	Mappings and Transformations
10/01	7.3	Linear Transformations **(Student Lecture)**
10/03	7.3	Base Changes and Coordinate Changes **(Student Lecture)**
10/05	7.3	Symmetric Positive-Definite Matrix **(Student Lecture)**
10/08	7.4	Differentials of Transformations
10/10	7.5	Inverses of Transformations
10/12	7.6	The Implicit Function Theorem
10/15	7.7	Functional Dependence
10/17	8.3	Transformation of Multiple Integrals **(Student Lecture)**
10/19	8.4	Curve and Arc Length **(Student Lecture)**
10/22	8.5	Variable Changes in Multiple Integrals
10/24	8.6	Integral Over Curves
10/26	8.6	Integral Over Surfaces
10/29		Review 2
10/31		**Test 2**
11/02		Introduction of High-Dimensionality Reduction
11/05		Examples of High-Dimensional Data
11/07		Principal Component Analysis
11/09		Multi-Dimensional Scaling
11/12		Distances and similarities of Points in Data
11/14		Local Linear Embedding (I)
11/16		Local Linear Embedding (II)
11/19		Maximum Variance Unfolding (I)
11/26		Maximum Variance Unfolding (II)
11/28, 30		**Final Presentations**
12/3, 5, 7, 12		**Final Presentations**