

Department of Electrical and Computer Engineering
520.419 Theory and Design of Iterative Algorithms

- 2004-05 Catalog: An introduction to the study of the structure, behavior and design of iterative algorithms. Topics include problem formulations, algorithm description and classification, the deterministic iterative (DI) schema, doubling schema, cluster point sets, periodic points, DI schemas without stop rule, the monotonic DI schema, contractive and affine maps, bounded and Cauchy sequences, asymptotically regular sequences, monotonic sequences. (3 credit hours/Elective)
- Prerequisite(s): 110.201 Linear Algebra
110.202 Calculus III
- Textbook: Class Notes
- Course Objectives: Development of the ability to analyze and synthesize iterative algorithms to solve problems of interest to electrical engineers
- Topics Covered:
1. Solution set and relations between problems
 2. Parameterized families of problems
 3. Problem formulations
 4. Algorithm description and classification
 5. Family of sequences
 6. Characteristic set of the deterministic iterative (DI) schema
 7. Analysis and synthesis of the DI schema
 8. The Liapunov matrix equation
 9. Doubling scheme
 10. Cluster point set
 11. Periodic points
 12. DI schema without stop rule
 13. Topological concepts in E^n
 14. Bounded and Cauchy sequences
 15. Asymptotically regular sequences
 16. Monotonic sequences
- Class Schedule: Three – one hour classes weekly

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Contribution of Course to Meeting the Professional Component (credit hours):

Engineering Science	Engineering Science and Design
3	

Relationship of Course to Program Educational Outcomes (those that apply):

<input checked="" type="checkbox"/>	Apply mathematics, probability and statistics, basic science, and computer science
<input checked="" type="checkbox"/>	Design and conduct experiments, analyze and interpret data
	Identify, formulate and solve electrical engineering problems
<input checked="" type="checkbox"/>	Use technical skills and modern engineering tools to design to meet needs
	Communicate effectively and work on multidisciplinary teams
	Contemporary issues, ethical responsibilities, environmental, health, safety issues
<input checked="" type="checkbox"/>	Engage in life-long learning

Prepared June 1, 2005 by: Gerard G.L. Meyer