Syllabus

National Dong Hwa University
School of Management

GSLM 53500
Heuristic Optimization
Spring 2009

Instructor: Prof. Vincent C. Li
Office: B310
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Phone: 863-3165
Class Time: Thursday 9:10 AM - noon
Office Hours: Wednesday 10 AM - noon

Course Contents
This course addresses heuristic optimization, complexity theory, and integer programming techniques. Metaheuristics will be a focus in the heuristic optimization part. In particular, we will study simulated annealing (SA), genetic algorithms (GA), tabu search (TS), scatter search (SS), and greedy randomized adaptive search procedures (GRASP).

Course Structure
This is an advanced research course with an emphasis on self exploration. There will be a project, homework assignments, and team paper presentations. Programming of some sort (C, C++, Basic, Java, etc.) is required to implement the project and some of the assignments.

Grading
The final course grade will be determined based on the following categories: Group Article Presentations (15%), Homework (20%), Project (30%), Final Exam (20%), Class Participation (15%).

Textbook & References
Handouts and papers for metaheuristics will be distributed throughout the semester. Some of the references are listed as follows.

General framework of local search and metaheuristics

Introduction to various metaheuristics
SA

GA
■ D. Whitney, A Genetic Algorithm Tutorial, Computer Science Dept. Colorado State University, 1993

TS

SS
■ L. M. Hvattum and A. Lokketangen, Experiments using scatter search for. the multidemand multidimensional knapsack problem. MIC 2005 Post. Conference Volume

GRASP

Surrogate constraint

MISC
■ H. Ramalhinho-Lourenço, Logistics Management: An Opportunity for Metaheuristics, in collection, Metaheuristic Optimization Via Memory and Evolution: Tabu Search and Scatte Search, C. Rego and B. Alidaee (Eds.), 2005
**Homework Assignments**
All homework assignments have equal weights and are based on individual work unless otherwise specified. You are encouraged to discuss assignments with your classmates. However, you must ultimately demonstrate your understanding of the materials by writing up your own answers without the help of other students or their written work.

You are not to use homework from previous years to solve the homework. While every effort is made to have different questions, some overlap will necessarily exist. Do not exploit this overlap.

Coding may be required in some of the homework assignments. In this kind of assignments, submit a hard copy of your code and the corresponding results. Make sure you have included necessary comments within your code.

**Project**
The project should solve a problem related to supply chain management, logistics management, operations management or operations research in general, using any metaheuristics covered in the class. Other methods of metaheuristics are also possible upon approval by the instructor. You are not to use projects from previous years to solve the project. However, you may use some variants of previous projects upon approval by the instructor. The project should be done by individual.

The project proposal is due on May 7. A written proposal of 3 to 5 pages and a 10-minute oral presentation are required. The project presentations are scheduled on June 18. We reserve 30 minutes for presentation and 10 minutes for Q&A for each person. The final written report is due on June 25.

**Article Presentations**
Throughout the semester, each group will be assigned two to three articles for presentation. Even if it is not your turn to present the paper, you are still expected to read the paper in advance so that you can make some contributions in the discussion.

**Class Participation**
Participation in class discussion is absolutely essential. Students have a responsibility to themselves, their fellow classmates, and the instructor to be prepared and participated in classroom discussions. Learning is an interactive process. Ask a question when you do not understand part of the lecture. It is likely that other people do not understand it either.

Participation points are evaluated based on the following categories.
- A. Excellent (81~100% of the maximum participation score)
- B. Very Good (61~80% of the maximum participation score)
- C. Adequate (41~60% of the maximum participation score)
- D. Fair (21~40% of the maximum participation score)
- E. Poor (0~20% of the maximum participation score)

Reduction in class participation: Any unnecessary disruption to the class may lower a student’s class participation grade. Such disruptions include, but are not limited to, arriving late, leaving early,
entering and leaving classroom during class, chatting with your neighbor, sleeping, and eating. Please notify me in advance if you ever need to show up class late or leave class early. As a courtesy, please turn off or mute your cell phones during class. Last but not least, unexcused absences will also reduce your point of class participation.

**Plagiarism**

Plagiarism on assignments or projects will not be tolerated at this class. Anyone who violates this policy will receive a failing grade for this course. You are plagiarizing if you turn in some work that you did not actually write (i.e., you just copied work from friends). You are involved with plagiarism if you let friends copy your work.

In addition, if you use some contexts from resources like books, papers, and internet articles, be sure to give adequate acknowledgement. Failing to include quotations or give the appropriate citation is considered a plagiarized behavior.

**Class Website**

The course website is maintained at the following address: [http://faculty.ndhu.edu.tw/~vli/work/Courses/HO/ho.html](http://faculty.ndhu.edu.tw/~vli/work/Courses/HO/ho.html). The instructor may use this website to post homework assignments, class materials, etc.
Tentative Schedule (subject to change.)

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<td>Introduction to Heuristics</td>
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<td>3</td>
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<td>Introduction to Heuristics</td>
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