

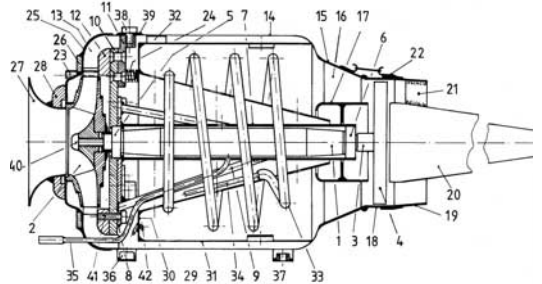
# DESIGN OF SMALL SCALE GAS TURBINE SYSTEMS FOR UNMANNED-AERIAL VEHICLES

(AERSP 597/497-K) **SPRING 2004**  
M/W/F 2:30 - 3:20 pm 215 Hammond



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## Summary :

The proposed course is a three-credit gas turbine design course using a small scale turbo-jet engine as a teaching/design vehicle. The course is geared towards graduate students and senior level undergraduate students as a technical elective. The students will learn/improvise/design actual components that will eventually go into an operational test bed. The course instructor will lead the design groups and some of the grading will be based on the final presentations given to a design review board. Effective time management of project milestones will be encouraged and the students will be evaluated against (agreed) deadlines by the instructor. A number of lecturers from the gas turbine industry will be invited for design seminars and review meetings during the semester.

## Course Outline :

Introduction to Small Scale Turbomachinery systems (2)  
Fluid Mechanics and Thermodynamics of Turbomachinery for  
Unmanned Aerial Vehicles (UAV) (4)  
Turbomachinery Component Design

Centrifugal compressor design for reduced size  
(emphasize reduced size and use of composite materials) (6)  
A single stage axial flow turbine design (6)  
Mechanical aspects of shaft and rotor disk design (3)  
Design of a small scale and efficient combustor (6)  
Inlet, diffuser and nozzle design system (6)

Gas Turbine Component Matching (3)  
Gas Turbine Health Monitoring and Control Mechanisms (3)  
Presentations and lab activities (6)

