Individual Teaching Grant Application

(Example of sections A. – E. from a previously funded application)

A. General Information

Project Title	**Purchase of a low-cost rotating tank for classroom demonstrations**
Principal Investigator	**Thomas Reichler**
University ID	00000000
Department	Department of Meteorology
Rank	Assistant Professor
Campus Address	819 WBB
E-mail	thomas.reichler@utah.edu
Phone	585-0040
Chair	Dr. Steenburgh

1. When would the grant activities be undertaken?	Beginning in 2007
3. Total amount requested.	$3,000.00
2. Has other funding been received for this project?	Yes/No: No
If yes, state sources and amounts.	
3. Is other funding being sought for this project?	Yes/No: No
If yes, state sources and amounts.	
4. Does project involve research using human subjects?	Yes/No: No
If yes, has IRB approval been obtained?	Yes/No:

B. Project Summary *(150-word limit, 12-point font single-spaced.)*

I am applying for a teaching grant in the amount of $3000 to purchase a rotating tank, which is a relatively simple device used to make classroom demonstrations of important meteorological concepts. This device will allow the practical exploration of many topics that are usually covered in class from a purely theoretical viewpoint. The device can be used in a wide range of classes at the undergraduate and graduate level, which will help the University of Utah to maintain its status of having one of the nation's top ranked programs in meteorology.

Date submitted	09/16/2006
If this grant is funded may we place your summary and e-mail address on the committee's web page?	Yes/No: Yes

If you convert this document to PDF and want to include digital signatures of PI and chair, please place them below:

Purchase of a low-cost rotating tank for classroom demonstrations

Thomas Reichler, Assistant Professor, Department of Meteorology

C. Narrative *(1,000 word limit, 12-point type double-spaced, 1-inch margins. Please enter your project title and name, rank, and department above.)*

Need and rationale. In many disciplines of science laboratory experiments are an important aspect of the educational process, shedding new insight on the sometimes complicated nature of the particular process under study. A rotating tank is a relatively simple device used to demonstrate important meteorological concepts. The Department of Meteorology offers a comprehensive program at the undergraduate and graduate level where such a device would be highly desirable. At many institutions[1] where meteorology is taught, rotating tank experiments form now part of the routine curriculum. The University of Utah is currently lagging behind in the course offering relating to the demonstration of geophysical fluid dynamical phenomena.

Because the earth is rotating, the Coriolis and centrifugal forces have to be taken into account for the demonstration of meteorological phenomena. Typically cylinders filled with water on a rotating platform, rotating tanks can be used in various ways to demonstrate important dynamical concepts of the atmosphere. Flow phenomena can be visualized using dye injections. For example, a rotating tank with an ice bucket in the center can represent the earth, with a cold pole simulated by the ice bucket; just as in the real atmosphere, eddies and a westerly jetstream form in the water.

[1] e.g., U Hawaii (www.soest.hawaii.edu/OE/efdel/Rotatingt.htm), Massachusetts Institute of Technology (www-paoc.mit.edu/labweb/experiments.htm), Colorado State U (einstein.atmos.colostate.edu/~mcnoldy/spintank), U South Carolina (sampit.geol.sc.edu/Spintank.html), U Colorado (nimbus.colorado.edu/hart/science.htm), U Washington (www.ocean.washington.edu/research/gfd/index.html), U California (hydraulicslab.ucsd.edu).

Objectives. The objective of this proposal is to enhance the teaching capabilities at the Department of Meteorology by being able to perform experiments in the classroom or laboratory. The department is one of the nation's top ranked programs in meteorological research, and undergraduate and graduate education. By introducing this new innovative teaching tool I want to contribute to maintain this standard of excellence.

Plan and time-line. I plan to purchase a low-cost rotating turntable system to be used for various meteorology classes at the undergraduate and graduate level. I already located a suitable manufacturer: JS Engineering from Putnam, CT. The company has been recommended to me by Prof. John Marshall from the Program in Ocean and Atmospheric Sciences at MIT. MIT has purchased several such turntables from this firm over the years. The system to be purchased is similar to that shown in the photo below and includes:

- rotating turntable
- camera on top
- video system
- circular fluid tank
- water storage tank
- assorted dyes, ice bucket, glassware
- rolling cart for class-room setting


(i)

After receiving the order, JS Engineering will manufacture and deliver the turn table in approximately 8-10 weeks. At this time, the system should be ready for use.

Expected outcomes. Rotating tank experiments will greatly improve our capabilities to convey important theoretical concepts of geophysical fluid dynamics to the students. The device can be used in virtually any class that teaches meteorology, ranging from introductory classes such as METEO 1020 (climate change) to advanced graduate level classes like METEO 6210 (advanced dynamic meteorology). Many topics that are usually covered in class from a purely theoretical viewpoint will now be explored using experiments. The topics will be demonstrated directly in the classroom or in special lab sessions to supplement the more rigorous mathematical treatment typically given in those courses. This will help students to gain a deeper understanding of the often very abstract and theoretical material.

D. Budget *($3,000 limit.)*

Materials

Item	Source	Cost
GFD turntable and cart	JS Engineering, Putnam, CT	3,000.00

Total materials: 3,000.00

Travel

Item	Source	Cost
none		

Total travel: 0

Total request: $3,000.00

E. Courses Taught *List courses that the principal investigator has taught, or is scheduled to teach, in the three most recent academic years. If you have not taught in any of these years, please explain.*

Year	Course # & Title	Credit hours	Typical enrollment
2006 – 2007	METEO 6010, Dynamic Meteorology	3	10
	METEO 6030, Earth Climate System	3	10
2005 – 2006	METEO 6010, Dynamic Meteorology	3	10
	METEO 6030, Earth Climate System	3	10
	MATH 6790, Numerical Modeling of Atmospheric Flow	3	10
2004 – 2005	METEO 6010, Dynamic Meteorology	3	10
	METEO 6030, Earth Climate System	3	10

F. Principal Investigator's Curriculum Vitae. *(This condensed CV should be the equivalent of 3 pages or fewer of text in 12-point font with 1-inch margins on 8.5" x 11" paper.)*

The CV was omitted from this example.

You must include one with your application.

G. Support letter from Department Chair. *(Insert text of letter below.)*

The Chair's letter was omitted from this example.

You must include one with your application.