1. Course information:
ELECTRIC CAR CONVERSION ES F166-FQ1, 2 credit (1+3)
Prerequisites: None
Location: Duckering, 252, Meeting time: MTWRF 6pm-10pm, plus 15 hours online

2. Instructor
Michael Golub, Office location: TBA, Office hours:TBA
Telephone: 907-347-4363, email: ffmig@uaf.edu

3. Course readings/materials:
Course Handouts will be provided.
The following books are recommended, but **not required**:
Convert It!, Michael Brown, 2ed, SFEAA, ISBN:1879857944
Build Your Own Electric Vehicle, Bob Brant, Tab Books; 1ed, ISBN:0830642323

4. Course description: An introduction to the principles of electrical vehicle propulsion systems. Fundamentals of electrical motors, electrical motor controls, electrical energy storage systems, and automotive power-train design. The student will conduct practical design projects culminating with a complete electric car conversion. Relevant codes and standards will be emphasized.

5. Course Goals: Students completing this course will have an improved understanding of how an automobile can be converted to run on battery power.

6. Instructional methods:
Lecture and Instructor-Interactive Lab

7. Course calendar: (Homework, Quizzes, and Final Exam in Italics)

Week 1

Mon,Jan 4:	Introductions and Shop Safety
	Online Component Overview
	Lab: Introduction to Lab Techniques
	History of Electric Cars and Construction Overview
Tue, Jan 5:	Lab: Internal Engine Preparation
	Removal of Internal Combustion Engine Explained
	Lab: Engine Compartment Layout, *HW #1 assigned*
Wed, Jan 6:	Preparations for Motor Installation, *Quiz #1*
	Lab: Install Electric Motor
	Power and Energy Requirements, *HW #1 Due*
Thu, Jan 7:	Lab: Testing Battery Voltage, Data Analysis
	Batteries and Installation
	Lab: Machine Shop Tour, Install Battery Box
Fri, Jan 8:	Chassis modifications, *HW #2 assigned*
	Lab: Install Batteries

Week 2

Mon, Jan 11:	Controllers and Installation
	Lab: Install Controller
Tue, Jan 12:	Charger installation, *HW #2 Due, Quiz #2*
	Lab: Install Battery Charger
	Data Logging, *HW #3 assigned*
Wed, Jan 13:	Other Transportation Systems
	Lab: Produce Specifications
Thu, Jan 14:	Future Technologies, *HW #3 Due*
	Lab: Discuss Improvements to Project Car
Fri, Jan 15:	*Final Exam*, Group Presentations
	Lab: Remaining Work to Complete Car and Testing

8. Course policies:

You are expected to attend classes regularly. If an unforeseen circumstance prevents you from attending class you are expected to contact the instructor prior to the start of class. Tests must be taken when scheduled.

9. Evaluation: Plus/Minus grading will be used – see page 80 of the 2008-2009 UAF catalog for numerical equivalents in GPA.

Quiz 1	15%	A ≥90%	C ≥70%
Quiz 2	15%	A- ≥87%	C- ≥67%
Final Exam	20%	B+ ≥83%	D+ ≥63%
Attendance	10%	B ≥80%	D ≥60%
Group Presentation	30%	B- ≥77%	D- ≥57%
Home Work	10%	C+ ≥73%	F <57%

Homework, Quizzes, and the Final Exam cover concepts related to determining the power and energy requirements of the EV, EV motor controllers, EV energy storage systems, data logging, and installation procedures.

10. Group Presentation:

The class will be split into teams of 3 to 4 students each and will be tasked with duplicating the process required to complete the conversion of the automobile to an electric car. These tasks include, but are not limited to: 1) motor mounting procedures 2) battery box construction in battery bank installation 3) instrumentation and data logging 4) high voltage (no voltage is applied) wiring and conduit and 5) other important installation procedures. Each student in the group is expected to contribute to the task of their group and the class in converting an automobile to an electric vehicle. Evaluation of the group presentation (30% of the overall course grade) will be on a per student basis and include the following:

1) successful completion of the assigned task (5% out of the 30%)

2) the contribution of each student (5% out of the 30%),

3) written description (10% out of the 30%), and

4) oral description (10% out of the 30%).

11. Support Services:

I am available (TBD) if you need further assistance with the course content.

12. Disabilities Services:

The Office of Disability Services implements the Americans with Disabilities Act (ADA), and insures that UAF students have equal access to the campus and course materials. I will work with the Office of Disabilities Services (203 WHIT, 474-7043) to provide reasonable accommodation to students with disabilities.