



## PROGRAM OF STUDY

### Automotive Research and Development - Certificate of Achievement

Term Effective: Fall 2010

Total Units: 27 - 35

The High Performance Institute offers a Certificate of Achievement in Automotive Research & Development. The field of automotive research & development offers many exciting career opportunities, including: engineering design, prototype building, vehicle evaluation & engineering, materials engineering, powertrain tuning and design, regulatory affairs and advanced technical research. The Citrus Certificate of Achievement in Automotive Research & Development offers two areas of emphasis: Engine Research, Development & Testing; and Chassis & Drivetrain Research, Development & Testing. The Engine Research, Development & Testing concentration provides a solid background in engine design and development, as well as testing procedures using both engine and chassis dynamometers. The Chassis & Drivetrain Research, Development & Testing concentration focuses on brake design and analysis, suspension upgrades and alignment challenges, the research & development of automatic and manual transmissions improvements, as well as testing procedures using a transmission dynamometer.

The Certificate of Achievement in Automotive Research & Development is a stepping stone to exciting career opportunities. Completion of the certificate is excellent preparation for students desiring to transfer to a four-year university to pursue a degree in engineering, production technology or industrial technology. Students can also choose to step directly into the exciting world of the automotive aftermarket or new vehicle production where a number of entry-level positions await the highly-motivated student.

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#### Required courses. Choose one of the following two areas of emphasis:

<b>Engine Research, Development and Testing Emphasis. Complete the following courses:</b>					
Course	Title	Units	Completed	In Progress	Need
AUTO 295	Engine Design	4			
AUTO 296	Cylinder Head Development	4			
AUTO 297	Cylinder Block Development	4			
AUTO 299	Engine Dynamometer Operation and Testing Procedures	2			
AUTO 291	Engine Performance Enhancements and Tuning	3			

**Chassis and Drivetrain Research, Development and Testing Emphasis.**

Complete the following courses:

Course	Title	Units	Completed	In Progress	Need
AUTO 292	Advanced Drivetrain Development	2			
AUTO 298	Special Projects	2			
AUTO 290	Introduction to the Automotive Aftermarket	1			
AUTO 294	Brake Design and Analysis	3			
AUTO 293	Advanced Steering, Suspension Geometry, Brake Design and Analysis	3			

Plus: Complete the following General Education courses:

Course	Title	Units	Completed	In Progress	Need
TECH 100	Principles of Technology <b>or</b>	3			
PHYS 110	Introduction to College Physics	4			
MATH 150	Intermediate Algebra	5			
ENGL 101	Reading and Composition <b>or</b>	3			
ESL 101	Reading and Composition	3			

Choose two of the following elective courses:

Course	Title	Units	Completed	In Progress	Need
ENGR 125	Introduction to Engineering CAD	2			
ENGR 122	Engineering Drawing	3			
DRAF 101	CAD (Computer Aided Design) and Mechanical Drawing	3			
BUS 132	Ethics in Business	3			
BUS 130	Introduction to Business	3			
AUTO 190	Introduction to Compressed Natural Gas Vehicles <b>or</b>	3			
MTRK 190	Introduction to Compressed Natural Gas Vehicles	3			
Or select two additional courses (5 or more units total) from another area of emphasis above.		5 - 8			

Total Units: 27 - 35

[Certificates of Achievement general policies and procedures](#),  
or go to: [www.citruscollege.edu/stdntsrv/counsel/certificates](http://www.citruscollege.edu/stdntsrv/counsel/certificates)