

Automotive Technology: Engine Performance

ASSOCIATE IN SCIENCE *or* CERTIFICATE OF ACHIEVEMENT

The **AS degree** will be awarded upon satisfactory completion of the major course requirements listed below and the General Education requirements for the Associate in Arts Degree listed in the Degrees and Programs section of this Catalog.

A **Certificate of Achievement** will be awarded upon satisfactory completion of the major course requirements listed below for each option with a minimum GPA of 2.0.

Career Opportunities

The Automotive Technology curriculum is designed to prepare students for employment as apprentice auto mechanics.

Upon registering for a class in the automotive major area, a student will receive a list of required basic tools. **The student will be expected to purchase tools that relate to the course in which he/she has enrolled.** The purpose of this requirement is to assure that all students graduating from the program possess tools in a quantity sufficient for trade entry as an apprentice.

Upon graduating with an Associate in Science (AS) degree, the beginning apprentice will have the union four-year night school requirement waived. The graduate with only a Certificate of Completion will have two of the required four years of night school waived. The National Institute for Automotive Service Excellence (ASE) will give one year experience credit for our two-year program towards the ASE certification program in Auto Mechanics.

Confer with the division counselor for the specific course pattern of requirements and prerequisites. Students may not take more than one of the following 10-unit "major" courses in a single semester: ATECH 10, 11, 12, 14, 15, 40, 41, 42, and 45. Priority for enrollment in any "major" class will be given to students with the most seniority in the program. A minimum grade of "C" in ATECH 21 and 22 may be required for enrollment in a student's first "major" course.

Associate in Science (AS) Degree and Certificate of Achievement Programs:

It is recommended that these courses be completed prior to enrollment in any of the "major" Auto Mechanics classes:

- One year of high school algebra or completion of MATH 225 with a grade of "C" or better.

Program Learning Outcomes

Upon completion of this program a student will be able to:

- **Commitment to Learning:** Be 'lifelong learners' in the field of automotive technology, keeping up with changes in vehicles, in diagnostics and in repair procedures through a commitment to continual learning and training.
- **Communication:** Communicate effectively with customers, supervisors and co-workers.
- **Critical Thinking:** Apply critical thinking and problem solving skills in the process of diagnosing and repairing vehicles.
- **Performance:** Competently perform industry standard automotive repair procedures, using proper tools, procedures and diagnostic techniques, as specified in the NATEF program certification process.

Degree Major/Certificate Requirements

| DEPT/NO. | TITLE | UNITS |
|-------------|---|-------|
| ATECH 21 | Transportation Technology Principles | 4 |
| ATECH 22 | Introduction to Auto Mechanics | 4 |
| BUS 208* | Communication Skills for Technicians | 3 |
| MATH 225* | Math for Technicians | 3 |
| ATECH 11 | Engines and Fuel Systems | 10 |
| ATECH 12 | Electrical/Electronic Systems | 10 |
| ATECH 24A** | Computer Controls and Fuel Injection | 4 |
| ATECH 14** | Advanced Engine Performance | 10 |
| ATECH 25** | Clean Air Course, Phase II | 4 |
| ATECH 27** | Advanced Emissions Diagnostics: Smog Check II | 2 |

Total Required Units: 54

* Candidates for the AS Degree should take Mathematics and English classes required for that degree.

** Atech 11 is a prerequisite for Atech 24. Atech 11 and Atech 12 are prerequisites for Atech 14 and 25. Atech 24A is a prerequisite for Atech 27.

Recommended Course Sequence

| | COURSE | | UNITS | REQUIREMENT | COA GE AREA |
|-------------------------------|-------------------------------|---|--------------|-------------|---------------------------|
| FALL 1 | ATECH 21 | Transportation Technology Principles | 4 | Major | |
| | ATECH 22 | Introduction to Auto Mechanics | 4 | Major | |
| | COMM 6 COMM 20 | Intercultural Communication or Interpersonal Communication Skills | 3 | Major | (2 or 4D) or 4D |
| | MATH 15 | Mathematics for Liberal Arts Students ¹ | 3 | Major | 4B |
| | Total Number of Units: | | 14 | | |
| SPRING 1 | ATECH 11 | Engines and Fuel Systems | 10 | Major | |
| | ENGL 1A ENGL 1AS | Composition and Reading or Composition and Reading (w/ support) | 4 or 5 | GE | 4A |
| | Total Number of Units: | | 14-15 | | |
| SUMMER 1 | HUMAN 2 MUSIC 10 | Human Values or Music Appreciation | 3 | GE | 3 |
| | ATECH 24A | Computer Controls and Fuel Injection | 4 | Major | |
| | Total Number of Units: | | 7 | | |
| FALL 2 | ATECH 12 | Automotive Electrical and Electronic Systems | 10 | Major | |
| | CIS 205 | Computer Literacy | 1 | GE | 4C |
| | SOC 5 PSYCH 18 | Minority Groups or Psychology of Race and Ethnicity in the U.S. | 3 | GE | 2 & 5 |
| | Total Number of Units: | | 14 | | |
| SPRING 2 | ATECH 14 | Advanced Engine Performance | 10 | Major | |
| | ATECH 25 | Clean Air Course, Phase II | 4 | Major | |
| | ATECH 27 | Advanced Emissions Diagnostics: Smog Check II | 2 | Major | |
| Total Number of Units: | | 16 | | | |
| SUMMER 2 | GEOG 1 | Physical Geography | 3 | GE | 1 |
| Total Number of Units: | | 3 | | | |

¹ Students can choose to take any other degree applicable math course.

Please meet with a counselor to develop a personalized education plan to help you meet your specific goals.

Recommended Course Sequence

| | COURSE | | UNITS | REQUIREMENT |
|-------------------------------|-------------------------------|---|-----------|-------------|
| FALL 1 | ATECH 21 | Transportation Technology Principles | 4 | Major |
| | ATECH 22 | Introduction to Auto Mechanics | 4 | Major |
| | BUS 208 | Communication Skills for Technicians | 3 | Major |
| | MATH 225 | Math for technicians (or higher) | 3 | Major |
| Total Number of Units: | | | 14 | |
| SPRING 1 | ATECH 11 | Engines and Fuel Systems | 10 | Major |
| | Total Number of Units: | | | 10 |
| SUMMER 1 | ATECH 24A | Computer Controls and Fuel Injection | 4 | Major |
| | Total Number of Units: | | | 10 |
| FALL 2 | ATECH 12 | Automotive Electrical and Electronic Systems | 10 | Major |
| | Total Number of Units: | | | 10 |
| SPRING 2 | ATECH 14 | Advanced Engine Performance | 10 | Major |
| | ATECH 25 | Clean Air Course, Phase II | 4 | Major |
| | ATECH 27 | Advanced Emissions Diagnostics: Smog Check II | 2 | Major |
| Total Number of Units: | | | 16 | |

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Automotive Technology: Chassis and Drivetrain

ASSOCIATE IN SCIENCE *or* CERTIFICATE OF ACHIEVEMENT

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Career Opportunities

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Confer with the division counselor for the specific course pattern of requirements and prerequisites. Students may not take more than one of the following 10-unit "major" courses in a single semester: ATECH 10, 11, 12, 14, 15, 40, 41, 42, and 45. Priority for enrollment in any "major" class will be given to students with the most seniority in the program. A minimum grade of "C" in ATECH 21 and 22 may be required for enrollment in a student's first "major" course.

Associate in Science (AS) Degree and Certificate of Achievement Programs:

It is recommended that these courses be completed prior to enrollment in any of the "major" Auto Mechanics classes:

- One year of high school algebra or completion of MATH 225 with a grade of "C" or better.

Program Learning Outcomes

Upon completion of this program a student will be able to:

- **Commitment to Learning:** Be 'lifelong learners' in the field of automotive technology, keeping up with changes in vehicles, in diagnostics and in repair procedures through a commitment to continual learning and training.
- **Communication:** Communicate effectively with customers, supervisors and co-workers.
- **Critical Thinking:** Apply critical thinking and problem solving skills in the process of diagnosing and repairing vehicles.
- **Performance:** Competently perform industry standard automotive repair procedures, using proper tools, procedures and diagnostic techniques, as specified in the NATEF program certification process.

Degree Major/Certificate Requirements

| DEPT/NO. | TITLE | UNITS |
|-----------|--------------------------------------|-------|
| ATECH 21 | Transportation Technology Principles | 4 |
| ATECH 22 | Introduction to Auto Mechanics | 4 |
| BUS 208* | Communication Skills for Technicians | 3 |
| MATH 225* | Math for Technicians | 3 |
| ATECH 10 | Automotive Chassis | 10 |
| ATECH 26 | Auto Electrical Systems | 4 |
| ATECH 15 | Drivetrain/Transmissions | 10 |
| ATECH 23 | Automotive Air Conditioning | 4 |

Total Required Units: 42

* Candidates for the AS Degree should take Mathematics and English classes required for that degree.

Recommended Course Sequence

| | COURSE | | UNITS | REQUIREMENT | COA GE AREA | |
|-----------------|-------------------------------|---|--------|--------------|-------------|--|
| FALL 1 | ATECH 21 | Transportation Technology Principles | 4 | Major | | |
| | ATECH 22 | Introduction to Auto Mechanics | 4 | Major | | |
| | ENGL 1A ENGL 1AS | Composition and Reading or Composition and Reading (w/ support) | 4 or 5 | GE | 4A | |
| | MATH 15 | Mathematics for Liberal Arts Students ¹ | 3 | Major | 4B | |
| | Total Number of Units: | | | 15-16 | | |
| SPRING 1 | ATECH 10 | Automotive Chassis | 10 | Major | | |
| | ATECH 26 | Introduction to Automotive Electrical Systems | 4 | Major | | |
| | CIS 205 | Computer Literacy | 1 | GE | 4C | |
| | Total Number of Units: | | | 15 | | |
| FALL 2 | ATECH 15 | Drivetrain / Transmissions | 10 | Major | | |
| | ATECH 23 | Automotive Air Conditioning | 4 | Major | | |
| | DANCE 68 KIN 54A | Modern Dance 1 or Cross Fitness I – Fundamentals | 1 | Elective | | |
| | Total Number of Units: | | | 15 | | |
| SPRING 2 | COMM 6 COMM 20 | Intercultural Communication or Interpersonal Communication Skills | 3 | Major | 4D | |
| | SOC 5 PYSCH 18 | Minority Groups or Psychology of Race and Ethnicity in the U.S. | 3 | GE | 2 & 5 | |
| | GEOG 1 | Physical Geography | 3 | GE | 1 | |
| | SPAN 1A VIET 1A | Elementary Spanish or Elementary Vietnamese | 5 | GE | 3 | |
| | DANCE 92 KIN 54B | Salsa I or Cross Fitness II – Beginning | 1 | Elective | | |
| | Total Number of Units: | | | 15 | | |

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Recommended Course Sequence

AUTOMOTIVE TECHNOLOGY

| | COURSE | | UNITS | REQUIREMENT |
|-------------------------------|-------------------------------|--------------------------------------|-----------|-------------|
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| | ATECH 22 | Introduction to Auto Mechanics | 4 | Major |
| | BUS 208 | Communication Skills for Technicians | 3 | Major |
| | MATH 225 | Math for technicians (or higher) | 3 | Major |
| Total Number of Units: | | | 14 | |
| SPRING 1 | ATECH 10 | Automotive Chassis | 10 | Major |
| | ATECH 26 | Auto Electrical Systems | 4 | Major |
| | Total Number of Units: | | | 14 |
| FALL 2 | ATECH 15 | Drivetrain / Transmissions | 10 | Major |
| | ATECH 23 | Automotive Air Conditioning | 4 | Major |
| | Total Number of Units: | | | 14 |

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Automotive Technology: Chassis Specialist

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Associate in Science (AS) Degree and Certificate of Achievement Programs:

It is recommended that these courses be completed prior to enrollment in any of the "major" Auto Mechanics classes:

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Program Learning Outcomes

Upon completion of this program a student will be able to:

- **Commitment to Learning:** Be 'lifelong learners' in the field of automotive technology, keeping up with changes in vehicles, in diagnostics and in repair procedures through a commitment to continual learning and training.
- **Communication:** Communicate effectively with customers, supervisors and co-workers.
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Degree Major/Certificate Requirements

| DEPT/NO. | TITLE | UNITS |
|-----------|--------------------------------------|-------|
| ATECH 21 | Transportation Technology Principles | 4 |
| ATECH 22 | Introduction to Auto Mechanics | 4 |
| BUS 208* | Communication Skills for Technicians | 3 |
| MATH 225* | Math for Technicians | 3 |
| ATECH 10 | Automotive Chassis | 10 |
| ATECH 40 | Advanced Automotive Chassis | 10 |

Total Required Units: 34

* Candidates for the AS Degree should take Mathematics and English classes required for that degree.

Recommended Course Sequence

FALL 1

| COURSE | | UNITS | REQUIREMENT | COA GE AREA |
|-------------------------------|---|-----------|-------------|---------------------------|
| ATECH 21 | Transportation Technology Principles | 4 | Major | |
| ATECH 22 | Introduction to Auto Mechanics | 4 | Major | |
| COMM 6 COMM 20 | Intercultural Communication or Interpersonal Communication Skills | 3 | Major | (2 or 4D) or 4D |
| MATH 15 | Mathematics for Liberal Arts Students ¹ | 3 | Major | 4B |
| Total Number of Units: | | 14 | | |

SPRING 1

| | | | | |
|-------------------------------|---|--------------|----------|----|
| ATECH 10 | Automotive Chassis | 10 | Major | |
| ENGL 1A ENGL 1AS | Composition and Reading or Composition and Reading (w/ support) | 4 or 5 | GE | 4A |
| DANCE 68 KIN 54A | Modern Dance 1 or Cross Fitness I – Fundamentals | 1 | Elective | |
| Total Number of Units: | | 15-16 | | |

FALL 2

| | | | | |
|-------------------------------|---|-----------|-------|-------|
| ATECH 40 | Advanced Automotive Chassis | 10 | Major | |
| GEOG 1 | Physical Geography | 3 | GE | 1 |
| SOC 5 PSYCH 18 | Minority Groups or Psychology of Race and Ethnicity in the U.S. | 3 | GE | 2 & 5 |
| Total Number of Units: | | 16 | | |

SPRING 2

| | | | | |
|-------------------------------|---|-----------|----------|----|
| SPAN 1A VIET 1A | Elementary Spanish or Elementary Vietnamese | 5 | Elective | 3 |
| CIS 205 | Computer Literacy | 1 | GE | 4C |
| COMM 1A BUS 208 | Introduction to Speech or Communication Skills for Technicians | 3 | Elective | |
| PSYCH 9A BUS 10 | Psychology of Interpersonal Relations or Introduction to Business | 3 | Elective | |
| HUMAN 2 MUSIC 10 | Human Values or Music Appreciation | 3 | GE | 3 |
| Total Number of Units: | | 15 | | |

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Automotive Technology: Chassis Specialist

CERTIFICATE OF ACHIEVEMENT

Recommended Course Sequence

| | COURSE | | UNITS | REQUIREMENT |
|------------------------|------------------------|--------------------------------------|-------|-------------|
| FALL 1 | ATECH 21 | Transportation Technology Principles | 4 | Major |
| | ATECH 22 | Introduction to Auto Mechanics | 4 | Major |
| | BUS 208 | Communication Skills for Technicians | 3 | Major |
| | MATH 225 | Math for technicians (or higher) | 3 | Major |
| Total Number of Units: | | | 14 | |
| SPRING 1 | ATECH 10 | Automotive Chassis | 10 | Major |
| | Total Number of Units: | | | 10 |
| FALL 2 | ATECH 40 | Advanced Automotive Chassis | 10 | Major |
| | Total Number of Units: | | | 10 |

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Automotive Technology: Engine Repair Specialist

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Career Opportunities

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Program Learning Outcomes

Upon completion of this program a student will be able to:

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- **Communication:** Communicate effectively with customers, supervisors and co-workers.
- **Critical Thinking:** Apply critical thinking and problem solving skills in the process of diagnosing and repairing vehicles.
- **Performance:** Competently perform industry standard automotive repair procedures, using proper tools, procedures and diagnostic techniques, as specified in the NATEF program certification process.

Degree Major/Certificate Requirements

| DEPT/NO. | TITLE | UNITS |
|-----------|--------------------------------------|-------|
| ATECH 21 | Transportation Technology Principles | 4 |
| ATECH 22 | Introduction to Auto Mechanics | 4 |
| BUS 208* | Communication Skills for Technicians | 3 |
| MATH 225* | Math for Technicians | 3 |
| ATECH 11 | Engines, Fuel and Ignition Systems | 10 |
| ATECH 41 | Advanced Engine Repair | 10 |

Total Required Units: 34

* Candidates for the AS Degree should take Mathematics and English classes required for that degree.

Recommended Course Sequence

| | COURSE | | UNITS | REQUIREMENT | COA GE AREA |
|-----------------|-------------------------------|---|--------------|-------------|---------------------------|
| FALL 1 | ATECH 21 | Transportation Technology Principles | 4 | Major | |
| | ATECH 22 | Introduction to Auto Mechanics | 4 | Major | |
| | COMM 6 COMM 20 | Intercultural Communication or Interpersonal Communication Skills | 3 | Major | (2 or 4D) or 4D |
| | MATH 15 | Mathematics for Liberal Arts Students ¹ | 3 | Major | 4B |
| | Total Number of Units: | | 14 | | |
| SPRING 1 | ATECH 12 | Automotive Electrical and Electronic Systems | 10 | Major | |
| | ENGL 1A ENGL 1AS | Composition and Reading or Composition and Reading (w/ support) | 4 or 5 | GE | 4A |
| | DANCE 68 KIN 54A | Modern Dance 1 or Cross Fitness I – Fundamentals | 1 | Elective | |
| | Total Number of Units: | | 15-16 | | |
| FALL 2 | ATECH 41 | Advanced Engine Repair | 10 | Major | |
| | GEOG 1 | Physical Geography | 3 | GE | 1 |
| | SOC 5 PSYCH 18 | Minority Groups or Psychology of Race and Ethnicity in the U.S. | 3 | GE | 2 & 5 |
| | Total Number of Units: | | 16 | | |
| SPRING 2 | SPAN 1A VIET 1A | Elementary Spanish or Elementary Vietnamese | 5 | Elective | 3 |
| | CIS 205 | Computer Literacy | 1 | GE | 4C |
| | COMM 1A BUS 208 | Introduction to Speech or Communication Skills for Technicians | 3 | Elective | |
| | PSYCH 9A BUS 10 | Psychology of Interpersonal Relations or Introduction to Business | 3 | Elective | |
| | HUMAN 2 MUSIC 10 | Human Values or Music Appreciation | 3 | GE | 3 |
| | Total Number of Units: | | 15 | | |

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Recommended Course Sequence

| | COURSE | | UNITS | REQUIREMENT |
|-------------------------------|-------------------------------|--|-----------|-------------|
| FALL 1 | ATECH 21 | Transportation Technology Principles | 4 | Major |
| | ATECH 22 | Introduction to Auto Mechanics | 4 | Major |
| | BUS 208 | Communication Skills for Technicians | 3 | Major |
| | MATH 225 | Math for technicians (or higher) | 3 | Major |
| Total Number of Units: | | | 14 | |
| SPRING 1 | ATECH 12 | Automotive Electrical and Electronic Systems | 10 | Major |
| | Total Number of Units: | | | 10 |
| FALL 2 | ATECH 41 | Advanced Engine Repair | 10 | Major |
| | Total Number of Units: | | | 10 |

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Automotive Technology: Automotive Electronics Specialist

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Program Learning Outcomes

Upon completion of this program a student will be able to:

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Degree Major/Certificate Requirements

| DEPT/NO. | TITLE | UNITS |
|-----------|--------------------------------------|-------|
| ATECH 21 | Transportation Technology Principles | 4 |
| ATECH 22 | Introduction to Auto Mechanics | 4 |
| BUS 208* | Communication Skills for Technicians | 3 |
| MATH 225* | Math for Technicians | 3 |
| ATECH 12 | Electrical / Electronic Systems | 10 |
| ATECH 42 | Advanced Auto Electronics | 10 |

Total Required Units: 34

* Candidates for the AS Degree should take Mathematics and English classes required for that degree.

Recommended Course Sequence

| | COURSE | | UNITS | REQUIREMENT | COA GE AREA |
|-----------------|-------------------------------|---|--------------|-------------|---------------------------|
| FALL 1 | ATECH 21 | Transportation Technology Principles | 4 | Major | |
| | ATECH 22 | Introduction to Auto Mechanics | 4 | Major | |
| | COMM 6 COMM 20 | Intercultural Communication or Interpersonal Communication Skills | 3 | Major | (2 or 4D) or 4D |
| | MATH 15 | Mathematics for Liberal Arts Students ¹ | 3 | Major | 4B |
| | Total Number of Units: | | 14 | | |
| SPRING 1 | ATECH 12 | Automotive Electrical and Electronic Systems | 10 | Major | |
| | ENGL 1A ENGL 1AS | Composition and Reading or Composition and Reading (w/ support) | 4 or 5 | GE | 4A |
| | DANCE 68 KIN 54A | Modern Dance 1 or Cross Fitness I – Fundamentals | 1 | Elective | |
| | Total Number of Units: | | 15-16 | | |
| FALL 2 | ATECH 42 | Advanced Auto Electronics | 10 | Major | |
| | GEOG 1 | Physical Geography | 3 | GE | 1 |
| | SOC 5 PSYCH 18 | Minority Groups or Psychology of Race and Ethnicity in the U.S. | 3 | GE | 2 & 5 |
| | Total Number of Units: | | 16 | | |
| SPRING 2 | SPAN 1A VIET 1A | Elementary Spanish or Elementary Vietnamese | 5 | Elective | 3 |
| | CIS 205 | Computer Literacy | 1 | GE | 4C |
| | COMM 1A BUS 208 | Introduction to Speech or Communication Skills for Technicians | 3 | Elective | |
| | PSYCH 9A BUS 10 | Psychology of Interpersonal Relations or Introduction to Business | 3 | Elective | |
| | HUMAN 2 MUSIC 10 | Human Values or Music Appreciation | 3 | GE | 3 |
| | Total Number of Units: | | 15 | | |

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Automotive Technology: Automotive Electronics Specialist

CERTIFICATE OF ACHIEVEMENT

Recommended Course Sequence

| | COURSE | | UNITS | REQUIREMENT |
|------------------------|------------------------|--|-------|-------------|
| FALL 1 | ATECH 21 | Transportation Technology Principles | 4 | Major |
| | ATECH 22 | Introduction to Auto Mechanics | 4 | Major |
| | BUS 208 | Communication Skills for Technicians | 3 | Major |
| | MATH 225 | Math for technicians (or higher) | 3 | Major |
| Total Number of Units: | | | 14 | |
| SPRING 1 | ATECH 12 | Automotive Electrical and Electronic Systems | 10 | Major |
| | Total Number of Units: | | | 10 |
| FALL 2 | ATECH 42 | Advanced Auto Electronics | 10 | Major |
| | Total Number of Units: | | | 10 |

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Automotive Technology: Drivetrain Specialist

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Career Opportunities

The Automotive Technology curriculum is designed to prepare students for employment as apprentice auto mechanics.

Upon registering for a class in the automotive major area, a student will receive a list of required basic tools. **The student will be expected to purchase tools that relate to the course in which he/she has enrolled.** The purpose of this requirement is to assure that all students graduating from the program possess tools in a quantity sufficient for trade entry as an apprentice.

Upon graduating with an Associate in Science (AS) degree, the beginning apprentice will have the union four-year night school requirement waived. The graduate with only a Certificate of Completion will have two of the required four years of night school waived. The National Institute for Automotive Service Excellence (ASE) will give one year experience credit for our two-year program towards the ASE certification program in Auto Mechanics.

Confer with the division counselor for the specific course pattern of requirements and prerequisites. Students may not take more than one of the following 10-unit "major" courses in a single semester: ATECH 10, 11, 12, 14, 15, 40, 41, 42, and 45. Priority for enrollment in any "major" class will be given to students with the most seniority in the program. A minimum grade of "C" in ATECH 21 and 22 may be required for enrollment in a student's first "major" course.

Associate in Science (AS) Degree and Certificate of Achievement Programs:

It is recommended that these courses be completed prior to enrollment in any of the "major" Auto Mechanics classes:

- One year of high school algebra or completion of MATH 225 with a grade of "C" or better.

Program Learning Outcomes

Upon completion of this program a student will be able to:

- **Commitment to Learning:** Be 'lifelong learners' in the field of automotive technology, keeping up with changes in vehicles, in diagnostics and in repair procedures through a commitment to continual learning and training.
- **Communication:** Communicate effectively with customers, supervisors and co-workers.
- **Critical Thinking:** Apply critical thinking and problem solving skills in the process of diagnosing and repairing vehicles.
- **Performance:** Competently perform industry standard automotive repair procedures, using proper tools, procedures and diagnostic techniques, as specified in the NATEF program certification process.

Degree Major/Certificate Requirements

| DEPT/NO. | TITLE | UNITS |
|-----------|--------------------------------------|-------|
| ATECH 21 | Transportation Technology Principles | 4 |
| ATECH 22 | Introduction to Auto Mechanics | 4 |
| BUS 208* | Communication Skills for Technicians | 3 |
| MATH 225* | Math for Technicians | 3 |
| ATECH 15 | Drivetrain / Transmissions | 10 |
| ATECH 45 | Adv Automotive Transaxles | 10 |

Total Required Units: 34

* Candidates for the AS Degree should take Mathematics and English classes required for that degree.

Recommended Course Sequence

| | COURSE | | UNITS | REQUIREMENT | COA GE AREA |
|-----------------|-------------------------------|---|--------------|-------------|---------------------------|
| FALL 1 | ATECH 21 | Transportation Technology Principles | 4 | Major | |
| | ATECH 22 | Introduction to Auto Mechanics | 4 | Major | |
| | COMM 6 COMM 20 | Intercultural Communication or Interpersonal Communication Skills | 3 | Major | (2 or 4D) or 4D |
| | MATH 15 | Mathematics for Liberal Arts Students ¹ | 3 | Major | 4B |
| | Total Number of Units: | | 14 | | |
| SPRING 1 | ATECH 15 | Drivetrain/Transmissions | 10 | Major | |
| | ENGL 1A ENGL 1AS | Composition and Reading or Composition and Reading (w/ support) | 4 or 5 | GE | 4A |
| | DANCE 68 KIN 54A | Modern Dance 1 or Cross Fitness I – Fundamentals | 1 | Elective | |
| | Total Number of Units: | | 15-16 | | |
| FALL 2 | ATECH 45 | Advanced Automotive Transaxles | 10 | Major | |
| | GEOG 1 | Physical Geography | 3 | GE | 1 |
| | SOC 5 PSYCH 18 | Minority Groups or Psychology of Race and Ethnicity in the U.S. | 3 | GE | 2 & 5 |
| | Total Number of Units: | | 16 | | |
| SPRING 2 | SPAN 1A VIET 1A | Elementary Spanish or Elementary Vietnamese | 5 | Elective | 3 |
| | CIS 205 | Computer Literacy | 1 | GE | 4C |
| | COMM 1A BUS 208 | Introduction to Speech or Communication Skills for Technicians | 3 | Elective | |
| | PSYCH 9A BUS 10 | Psychology of Interpersonal Relations or Introduction to Business | 3 | Elective | |
| | HUMAN 2 MUSIC 10 | Human Values or Music Appreciation | 3 | GE | 3 |
| | Total Number of Units: | | 15 | | |

¹ Students can choose to take any other degree applicable math course.

Please meet with a counselor to develop a personalized education plan to help you meet your specific goals.

Recommended Course Sequence

| | COURSE | | UNITS | REQUIREMENT |
|-------------------------------|-------------------------------|--------------------------------------|-----------|-------------|
| FALL 1 | ATECH 21 | Transportation Technology Principles | 4 | Major |
| | ATECH 22 | Introduction to Auto Mechanics | 4 | Major |
| | BUS 208 | Communication Skills for Technicians | 3 | Major |
| | MATH 225 | Math for technicians (or higher) | 3 | Major |
| Total Number of Units: | | | 14 | |
| <hr/> | | | | |
| SPRING 1 | ATECH 15 | Drivetrain/Transmissions | 10 | Major |
| | Total Number of Units: | | | 10 |
| <hr/> | | | | |
| FALL 2 | ATECH 45 | Advanced Automotive Transaxles | 10 | Major |
| | Total Number of Units: | | | 10 |
| <hr/> | | | | |

Please meet with a counselor to develop a personalized education plan to help you meet your specific goals.

A **Certificate of Proficiency in Light-Duty Auto Repair** is available upon satisfactory completion of the required courses listed below.

Career Opportunities

The Automotive Technology curriculum is designed to prepare students for employment as apprentice auto mechanics.

Upon registering for a class in the automotive major area, a student will receive a list of required basic tools. **The student will be expected to purchase tools that relate to the course in which he/she has enrolled.** The purpose of this requirement is to assure that all students graduating from the program possess tools in a quantity sufficient for trade entry as an apprentice.

Upon graduating with an Associate in Science (AS) degree, the beginning apprentice will have the union four-year night school requirement waived. The graduate with only a Certificate of Completion will have two of the required four years of night school waived. The National Institute for Automotive Service Excellence (ASE) will give one year experience credit for our two-year program towards the ASE certification program in Auto Mechanics.

Confer with the division counselor for the specific course pattern of requirements and prerequisites. Students may not take more than one of the following 10-unit "major" courses in a single semester: ATECH 10, 11, 12, 14, 15, 40, 41, 42, and 45. Priority for enrollment in any "major" class will be given to students with the most seniority in the program. A minimum grade of "C" in ATECH 21 and 22 may be required for enrollment in a student's first "major" course.

Students completing the following required courses will be eligible for the **Certificate of Proficiency in Light-Duty Auto Repair**. Confer with a counselor or division dean concerning the specific pattern of requirements for this program.

Program Learning Outcomes

Upon completion of this program a student will be able to:

- **Commitment to Learning:** Be 'lifelong learners' in the field of automotive technology, keeping up with changes in vehicles, in diagnostics and in repair procedures through a commitment to continual learning and training.
- **Communication:** Communicate effectively with customers, supervisors and co-workers.
- **Critical Thinking:** Apply critical thinking and problem solving skills in the process of diagnosing and repairing vehicles.
- **Performance:** Competently perform industry standard automotive repair procedures, using proper tools, procedures and diagnostic techniques, as specified in the NATEF program certification process.

Certificate of Proficiency Requirements

| DEPT/NO. | TITLE | UNITS |
|------------------------------|---|-----------|
| ATECH 22 | Introduction to Auto Mechanics | 4 |
| ATECH 26 | Introduction to Automotive Electrical Systems | 4 |
| ATECH 24A | Computer Controls and Fuel Injection | 4 |
| ATECH 234 | Introduction to Brakes, Alignment and Headlamp Aiming | 4 |
| Total Required Units: | | 16 |

Recommended Course Sequence

| | COURSE | | UNITS | REQUIREMENT |
|-------------------------------|-------------------------------|---|----------|-------------|
| FALL 1 | ATECH 22 | Introduction to Auto Mechanics | 4 | Major |
| | ATECH 234 | Introduction to Brakes, Alignment and Headlamp Aiming | 4 | Major |
| Total Number of Units: | | | 8 | |
| SPRING 1 | ATECH 26 | Introduction to Automotive Electrical Systems | 4 | Major |
| | Total Number of Units: | | | 4 |
| FALL 2 | ATECH 24A | Computer Controls and Fuel Injection | 4 | Major |
| | Total Number of Units: | | | 4 |

Please meet with a counselor to develop a personalized education plan to help you meet your specific goals.

Automotive Technology (ATECH)

The Automotive Technology curriculum is designed to prepare students for employment as apprentice auto mechanics or to allow students to continue toward a Baccalaureate degree in other advanced schools of technology in preparation for future management and teaching careers in the automotive industry.

The College of Alameda ATECH program is certified by the National Institute for Automotive Service Excellence (ASE) Educational Foundation Master Level program, and was recognized as the "Best Auto Mechanics Training Program" in California in 1999 and again in 2002 by the Industry Planning Council of the Motor Vehicle Manufacturers Association.

Instruction covers safety, trade ethics, use of hand and power tools, as well as the theory, repair and testing of automobiles and their components. Special emphasis is placed on the diagnosis and repair of electronic and computer control systems in late model automobiles.

ATECH 10 **Automotive Chassis**

- 10 units, 6 hours lecture, 12 hours laboratory (GR)
- Recommended preparation: ATECH 21 and 22 and MATH 225 and BUS 208
- Eligible for credit by examination
- Acceptable for credit: CSU

Introduction to automotive chassis systems: Principles of automotive brake and suspension systems, wheel balance, tire service, suspension and headlamp alignment; maintenance, troubleshooting procedures, and proper use of alignment and balancing machines, brake lathes and other diagnostic equipment; diagnosis, disassembly, inspection, and rebuilding of suspension and brake systems; emphasis on proper use of manuals and safe use of tools and equipment; preparation for CA State Brake and Lamp licensing exams. 0948.00

ATECH 11 **Engines, Fuel and Ignition Systems**

- 10 units, 6 hours lecture, 12 hours laboratory (GR)
- Recommended preparation: ATECH 21 and 22 and MATH 225 and BUS 208
- Eligible for credit by examination
- Acceptable for credit: CSU

Principles of automotive engines, fuel and ignition systems: Tool and equipment safety, maintenance procedures, use of diagnostic equipment, minor head and block machining; diagnosis, disassembly, inspection, and rebuilding of engines, fuel and ignition systems. 0948.00

ATECH 12 **Automotive Electrical and Electronic Systems**

- 10 units, 6 hours lecture, 12 hours laboratory (GR)
- Recommended preparation: ATECH 21 and 22 and MATH 225 and BUS 208
- Eligible for credit by examination
- Acceptable for credit: CSU

Basic electrical theory and the function, diagnosis, and repair of modern automotive electrical systems: Emphasis on the use of instrumentation in the diagnosis of electrical circuits and component failures. 0948.00

ATECH 14 **Advanced Engine Performance (Clean Air Course, Phase I)**

- 10 units, 6 hours lecture, 12 hours laboratory (GR)
- Prerequisite: ATECH 11 and 12
- Recommended preparation: ATECH 21 and 22 and MATH 225 and BUS 208
- Course includes 22 of the 120 hours of training mandated by the California State Smog Inspection program.
- Eligible for credit by examination
- Acceptable for credit: CSU

Advanced engine performance principles and procedures: Generic computer and fuel-injection controls and emission-control systems; preparation for the ASE Engine Performance examination, as well as partial preparation for the California State Test and Repair Technician examination. 0948.00

ATECH 15 **Drivetrain and Automatic Transmissions**

- 10 units, 6 hours lecture, 12 hours laboratory (GR)
- Recommended preparation: ATECH 21 and 22 and MATH 225 and BUS 208
- Eligible for credit by examination
- Acceptable for credit: CSU

Theory, operation, diagnosis, repair and maintenance of drivetrain and automatic transmissions: Single dry-disc clutches, manual transmissions/transaxles, universal joints, final drives, and hydraulically-controlled automatic transmissions and transaxles. 0948.00

ATECH 21 **Transportation Technology Principles**

- 4 units, 4 hours lecture (GR)
- Recommended preparation: MATH 225
- Eligible for credit by examination
- Acceptable for credit: CSU

Introduction to materials, mechanics, fluids, heat and electricity: Applications of physical principles to motor vehicle systems and repair; practice researching information in technical publications. 0948.00

ATECH 22**Introduction to Auto Mechanics**

- 4 units, 3 hours lecture, 3 hours laboratory (GR)
- Also offered as APPR 471. Not open for credit to students who have completed or are currently enrolled in APPR 471.
- Eligible for credit by examination
- Acceptable for credit: CSU

How cars work: Construction and operation of engines, engine support systems, drivetrains and chassis; vehicle maintenance services; shop procedures including safety, proper use of tools, equipment and shop manuals; how to write repair orders. 0948.00

ATECH 23**Automotive Air Conditioning**

- 4 units, 3 hours lecture, 3 hours laboratory (GR)
- Recommended preparation: ATECH 21 and 22 and MATH 225 and BUS 208
- Also offered as APPR 486. Not open for credit to students who have completed or are currently enrolled in APPR 486.
- Eligible for credit by examination
- Acceptable for credit: CSU

Study of automotive air conditioning systems: Principles and systems necessary for the installation, design, function, and repair of air conditioning units; maintenance, troubleshooting procedures, proper use of air conditioning charging station and recovery/recycle equipment; emphasis on proper use of manuals and safe use of tools and equipment. 0948.00

ATECH 24A**Computer Controls and Fuel Injection**

- 4 units, 3 hours lecture, 3 hours laboratory (GR)
- Prerequisite: Prerequisite: ATECH 11 or APPR 482
- Also offered as APPR 473A. Not open for credit to students who have completed or are currently enrolled in APPR 473A.
- Eligible for credit by examination
- Acceptable for credit: CSU

Automotive computer-control and fuel-injection systems: Service and repair of computer-control and fuel-injection systems by all manufacturers, with emphasis on "hands-on" electronic testing and diagnostic procedures of ignition, fuel, emission-control, and generic electronic fuel-injection systems. 0948.00

ATECH 25**Clean Air Course Phase II**

- 4 units, 4 hours lecture (GR)
- Prerequisite: ATECH 11 and 12
- Recommended preparation: ATECH 21 and 22 and MATH 225 and BUS 208
- Eligible for credit by examination
- Acceptable for credit: CSU

Course covers the second phase of the 120-hour Clean Air Course required by California's Biennial Inspection and Maintenance Program ("Smog Check Program"). Successful completion of the 120 hours of training qualifies the student to take the Test and Repair Technician examination.

Advanced engine performance principles and procedures: Carburetor/low-emission adjustments, spark controls, positive crankcase ventilation and fuel evaporation systems, thermostatic air cleaners, exhaust gas recirculation, air injection and catalytic converter systems, administrative rules, inspection procedures, nitrates of oxide (Nox) readings, and computer-controlled testing. 0948.00

ATECH 26**Introduction to Automotive Electrical Systems**

- 4 units, 3 hours lecture, 3 hours laboratory (GR or P/NP)
- Recommended preparation: MATH 225 and BUS 208
- Also offered as APPR 472. Not open for credit to students who have completed or are currently enrolled in APPR 472.
- Eligible for credit by examination
- Acceptable for credit: CSU

Introduction to automotive electrical systems: Electrical theory, chassis wiring, batteries, cranking, charging, and ignition systems; special emphasis placed on diagnosis and repair of vehicle chassis wiring. 0948.00

ATECH 27**Advanced Emissions Diagnostics: Smog Check II**

- 2 units, 1.5 hours lecture, 1.5 hours laboratory
- (GR or P/NP)
- Prerequisite: ATECH 24A
- Also offered as APPR 485. Not open for credit to students who have completed or are currently enrolled in APPR 485.
- Eligible for credit by examination
- Acceptable for credit: CSU

Five-gas analysis using BAR 97: Advanced emissions diagnostics and related topics. 0948.00

ATECH 40**Advanced Automotive Chassis**

- 10 units, 6 hours lecture, 12 hours laboratory (GR)
- Prerequisite: ATECH 10
- Recommended preparation: ATECH 21 and 22 and MATH 225 and BUS 208
- Acceptable for credit: CSU

Advanced and in-depth study of automotive brake and suspension systems, wheel balance, tire service, and suspension alignment; Tool and equipment safety; maintenance and troubleshooting procedures; proper use of alignment and balancing machines, brake lathes, and other diagnostic equipment; diagnosis, disassembly, inspection, and rebuilding of suspension and brake systems; emphasis on proper use of manuals and safe use of tools and equipment. 0948.00

ATECH 41**Advanced Engine Repair**

- 10 units, 6 hours lecture, 12 hours laboratory (GR)
- Prerequisite: ATECH 11
- Recommended preparation: ATECH 21 and 22 and MATH 225 and BUS 208
- Acceptable for credit: CSU

Advanced principles of automotive engine construction, design, and repair: Tool and equipment safety, use of diagnostic equipment, advanced head and block diagnosis, repair and machining; diagnosis, disassembly, inspection, reconditioning, and rebuilding of engines; troubleshooting engine problems. 0948.00

ATECH 42**Advanced Automotive Electronics**

- 10 units, 6 hours lecture, 12 hours laboratory (GR)
- Prerequisite: ATECH 12
- Recommended preparation: ATECH 21 and 22 and MATH 225 and BUS 208
- Acceptable for credit: CSU

Advanced diagnosis and repair techniques for modern automotive electrical systems: Stresses heavy use of instrumentation in the diagnosis of electrical circuitry and component failure. 0948.00

ATECH 45**Advanced Automotive Transaxles and Transmissions**

- 10 units, 6 hours lecture, 12 hours laboratory (GR)
- Prerequisite: ATECH 15
- Acceptable for credit: CSU

Advanced automotive transaxle and transmission theory: Theory of operation, diagnosis, and service techniques on a variety of computer-controlled automatic transmissions and transaxles for imported and domestic passenger vehicles or light trucks. 0948.00

ATECH 49**Independent Study in Automotive Technology**

- .5-5 units, .5-5 hours lecture (GR or P/NP)
- Acceptable for credit: CSU

In-depth exploration of an area or problem of the student's choice not covered by regular catalog offerings in in Automobile Technology. Student must obtain approval from an appropriate faculty member. For more details, see the section on independent study in the college catalog. 0948.00

ATECH 234**Introduction to Brakes, Alignment and Headlamp Aiming**

- 4 units, 3 hours lecture, 3 hours laboratory (GR)
- Also offered as APPR 484. Not open for credit to students who have completed or are currently enrolled in APPR 484.
- Eligible for credit by examination

Introduction to brake, alignment, and headlamp aiming systems: Operation, maintenance, troubleshooting, and adjustment of steering, suspension, braking, and headlamp aiming systems; emphasis on proper use of manuals and safe use of tools and equipment; preparation for the California State Brake and Lamp licensing exams. 0948.00