MINISTRY OF EDUCATION & TRAINING

**HO CHI MINH CITY UNIVERSITY OF TECHNOLOGY & EDUCATION**

**UNDERGRADUATE PROGRAM**

***Major of***

**AUTOMOTIVE ENGINEERING**

**NOVEMBER 2016**

 Ministry of Education and Training **SOCIALIST REPUBLIC OF VIETNAM**

 HCMC University of Technology and Education **Independence – Freedom – Happiness**

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| MINISTRY OF EDUCATION & TRAINING**HO CHI MINH CITY UNIVERSITY OF TECHNOLOGY & EDUCATION** | SOCIALIST REPUBLIC OF VIETNAMIndependence – Liberty - Happiness |

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**UNDERGRADUATE PROGRAM**

**Education Program:** Automotive Engineering

 **Level:** Undergraduate

**Major**: Automotive Engineering Technology

**Type of Program**: Full time

(Decision No……date….on………)

1. **Duration of Study:** 4 years
2. **Student Enrollment:** High-school Graduates
3. **Grading System, Curriculum and Graduation Requirements**

**Grading System: 10**

**Curriculum:** Based on regulations of Decision No 43/2007/BGDDT

**Graduation Requirements:**

*General condition***:** Based on regulations of Decision No 43/2007/BGDDT

*Condition of specialty***:** None

1. **The objectives and Expected Learning Outcomes**

**Goals**

Training human resources, improving intellectual standards of the people, fostering talents; researching science and technology for new knowledge & product creation to meet the requirements of development of economics & society, to ensure national defense, security and international integration.

Training learners have political quality, morality, knowledge, professional practice skills, research capacity, development of scientific applications and technologies that are commensurate with the level of training. They have a healthy body, creative capability and professional responsibility, adaptability to the work environment; spirit of serving the people.

Training Engineers of Automotive Engineering Technology (AET) major have basic scientific knowledge, fundamental knowledge, specialized knowledge of automobile major, analysis capability, solve problem skills and solutions assessment, ability contribution, design, operation of automobile systems, communication skill teamwork, professional attitudes, meet the development requirements of major and society. After graduation, the graduates are able to work in companies, factories, industrial manufactories or operation of automotive systems and AET education organizations.

**Objectives**

PO1. Have good general knowledge, fundamental engineering knowledge and intensive knowledge in the field of automotive engineering

PO2. Promote their own self-study skill, problem-solving skill and professional skills of automotive engineering field.

PO3. Communicate effectively, act as a good leader and work well in teams.

PO4. Improve their ability in conceiving, designing, implementing, operating automotive engineering systems, attain the ability for self-study and life-long learning.

1. **Outcomes**

**The expected learning outcomes**

After completing the program, graduates are able to:

1. **General knowledge, fundamental and specialized knowledge in automotive engineering major:**
* ELO 1: Applying basic knowledge of mathematics and science into engineering.
* ELO 2: Applying technology fundamental and specialized knowledge in Automotive Engineering Technology.
* ELO 3: Applying specialized knowledge in designing, calculating, testing, diagnosing automotive systems or managing and providing automobile services.
1. **Specialized and professional skills in automotive engineering major:**
* ELO 4: Analyzing, explaining and reasoning to solve automotive engineering problems.
* ELO 5: Experimenting and discovering automotive engineering knowledge.
* ELO 6: Attaining ability to think critically and systematically about automotive engineering problems.
1. **Communication skills and ability to work in multidiscipline areas:**
* ELO 7: Having management and professional skills necessary for promoting productivity in automobile industry.
* ELO 8: Being able to lead and function in teams.
* ELO 9: Being able to communicate well in written and spoken forms.
* ELO 10: Being able to communicate in English.
* ELO 11: Generalizing activities of organizations and enterprises in automotive industry.
1. **Skills to take shape of ideas, design, deploying and operate in automotive industry**
* ELO 12: Conceiving ideas of automobile systems.
* ELO 13: Designing, calculating and simulating working mechanism of automobile components.
* ELO 14: Having awareness of social effects and demands on Automotive Engineering Technology industry.
* ELO 15: Having awareness of professional development and life-long learning.
* ELO 16: Possessing professional ethics, environmental awareness and professional working manner.
1. **Allocation of credits**

Total credit of the program**:** 130 credits (without Physical Education, Military Education, and Supplementary Courses)

|  |  |
| --- | --- |
| **Groups of Courses** | **Credits** |
| **Total** | **Compulsion** | **Optional** |
| Foundation science courses | **40** | **36** | **4** |
| Political Education | 10 | 10 | 0  |
| Social Sciences | 4 | 0 | 4 |
| Mathematics and Natural Sciences | 21 | 21 | 0 |
| Informatics | 2 | 2 | 0 |
| Introduction to Automobile Engineering Technology | 3 | 3 | 0 |
| Physical Education |  | 4 (\*) |  |
| Military Education  |  | 10 (\*) |  |
| **Automotive Engineering courses** | **90** | **76** | **14** |
| Automotive engineering related courses | 24 | 20 | 4 |
| Fundamental automotive engineering courses | 26 | 22 | 4 |
| Advanced automotive engineering courses | 21 | 17 | 4 |
| Commercial and Management | 6 | 4 | 2 |
| Industrial Internship | 3 | 3 | 0 |
| Graduation Thesis | 10 | 10 | 0 |
| **Total** | **130** | **112** | **18** |

6.1. Foundation science courses

Compulsion courses: 36 credits

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **No.** | **Code** | **Course name** | **Credits** | **Note** |
|  | LLCT150105E | Principles of Marxist-Leninism | 5 |  |
|  | LLCT230214E | Vietnamese Communist Party Policy of Revolution | 3 |  |
|  | LLCT120314E | Ho Chi Minh’s Ideology | 2 |  |
|  | INME130125E | Introduction to Automobile Technology | 3 | (2+1) |
|  | IPRM131585E | MATLAB programming language | 2 |  |
|  | MATH141601E | Calculus I | 4 |  |
|  | MATH141701E | Calculus II | 4 |  |
|  | MATH141801E | Calculus III | 4 |  |
|  | PHYS 130402E | Principles of Physics 1 | 3 |  |
|  | GCHE130603E | Fundamental Chemistry A1 | 3 |  |
|  | MATH131529E | Applied Mathematics in Engineering | 3 |  |
|  | PHED110513E | Physical Education 1  | 1 | (\*) |
|  | PHED110613E | Physical Education 2 | 1 | (\*) |
|  | PHED130715E | Physical Education 3 (Elective) | 2 | (\*) |
|  | GDQP008031E | Military Education  |  10 | (\*) |
| **Total** | **36** |  |

Optional courses

Student chooses **4** credits from **14** credits below

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **No.** | **Code** | **Course name** | **Credits** | **Note** |
| 1 | INSO321005E | Introduction to Sociology | 2 | Choose 1 |
| 2 | PLSK320605E | Planning Skill | 2 |
| 3 | INLO220405E | Introduction to Logics | 2 |
| 4 | ULTE121105E | Learning Methods in University | 2 | Choose 1 |
| 5 | SYTH220505E | Systematic Thinking | 2 |
| 6 | PRSK320705E | Presentation Skill | 2 |
| **Total** | **4** |  |

6.2. Automotive Engineering Courses

6.2.1.    Automotive Engineering Related Courses

**-         Compulsory courses**: **20** credits

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **No.** | **Code** | **Course name** | **Credits** | **Note** |
|  | EDDG240120E | Descriptive Geometry & Technical Drawing  | 4 | (3+1) |
|  | THME230721E | Theoretical Mechanics | 3 |  |
|  | STMA230521E | Strength of Materials | 3 |  |
|  | TMMP230220E | Theory Of Machine And Machine Design  | 3 |  |
|  | THER222932E | Thermal Engineering | 2 |  |
|  | AEEE230833E | Automobile Electrical and Electronic Engineering | 3 | (2+1) |
|  | AMIC320133E | Application of Micro Controller  | 2 |  |
| **Total** | **20** |  |

**-         Optional courses (4 / 8 Credits)**

Student chooses **4** credits from8credits below

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **No.** | **Code** | **Course name** | **Credits** | **Note** |
|  | FLUI220132E | Fluid Mechanics (FME) | 2 | Choose 1 |
|  | HEAT220332E | Heating Transfer | 2 |
|  | ENMA220126E | Engineering Materials | 2 | Choose 1 |
|  | METE320126E | Metal Technology | 2 |
| **Total** | **4** |  |

6.2.2.    Fundamental Automotive Engineering courses

-         Compulsion courses: 22 credits

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **No.** | **Code** | **Course name** | **Credits** | **Note** |
|  | ICEP330330E | Internal Combustion Engine Principle | 3 |  |
|  | PICE331030E | Practice of Internal Combustion Engine  | 3 |  |
|  | IECT330830E | Engine Control Technology | 3 |  |
|  | PEMS331130E | Practice of Engine Management System | 3 |  |
|  | THOV330131E | Theory of Vehicle | 3 |  |
|  | AUPE330933E | Automotive Powertrain Electronics | 3 |  |
|  | PMDT321131E | Practice of Manual Drivetrain | 2 |  |
|  | PAES321133E | Practice of Automotive Electrical and Electronic  | 2 |  |
| **Total** | **22** |  |

-  Optional Courses (4 / 8 Credits)

Student chooses **4** credits from **8** credits below:

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **No.** | **Code** | **Course name** | **Credits** | **Note** |
|  | *ICEC330430E* | Internal Combustion Engine Calculation | 2 | Choose 1 |
|  | VEDE320231E | Vehicle Design | 2 |
|  | POAD321230E | Practice of Automotive Diagnosis  | 2 | Choose 1 |
|  | PBPA321331E | Practice of Automotive Body and Paint | 2 |
| **Total** | **8** |  |

6.2.3.    Advanced Automotive Engineering courses

-         Compulsion courses: 17 Credits

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **No.** | **Code** | **Course name** | **Credits** | **Note** |
|  | PODE321330E | Practice of Diesel Engine | 2 |  |
|  | HEVT321033E | Hybrid Electric Vehicle Technology | 2 |  |
|  | VNOV320431E | Vehicle Stability and NVH | 2 |  |
|  | ATMT320831E | Automatic Transmission and Transaxle | 2 | (1+1) |
|  | PBSS331231E | Practice of Automotive Braking, Suspension and Steering System | 3 |  |
|  | ASCS331433E | Automotive Safety and Convenience Systems | 3 |  |
|  | PABE331233E | Practice of Automotive Body Electrical Systems | 3 |  |
| **Total** | **17** |  |

-  Optional Courses (4 / 12 credits)

Student chooses **4** credits from **12** credits below:

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **No.** | **Code** | **Course name** | **Credits** | **Note** |
|  | CAES320530E | Computer Application in Engine Simulation  | 2 | Choose 1 |
|  | CAVS320831E | Computer Application in Vehicle Simulation  | 2 |
|  | CAMC320533E | Computer Application in measurement and Control  | 2 |
|  | ADRT330331E | Automotive Diagnosis and Repair Technology | 2 | Choose 1 |
|  | AFIV320830E | Alternative Fuel In Vehicle | 2 |
|  | EAEN320630E | Theory of Engine and Automotive Experiment | 2 |
| **Total** | **12** |  |

6.2.4. Commercial and Management

-         Compulsion courses: 4 credits

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **No.** | **Code** | **Course name** | **Credits** | **Note** |
|  | EPNS120406E | Enterprise Start-up | 2 |  |
|  | ASMA220230E | Automotive Service Management | 2 |  |
| **Total** | **4** |  |

-  Optional courses (2/6 credits)

Student chooses **2** credits from **6** credits below:

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **No.** | **Code** | **Course name** | **Credits** | **Note** |
|  | BUAD220305E | Business Administration | 2 | Choose 1 |
|  | IQMA220205E | Introduction to Quality Management | 2 |
|  | GEEC220105E | General Economics | 2 |
| **Total** | **6** |  |

6.2.5.    Internship and graduation thesis

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **No.** | **Code** | **Course name** | **Credits** | **Note** |
|  | PRGR 422130E | Graduation Internship | 3 |  |
|  | GRTH4102030E | Graduation Thesis | 10 | 2+8 |
| **Total** | **13** |  |

* + 1. **Supplementary courses**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **No.** | **Course Code** | **Course name** | **Credits** | **Note** |
|
|  | EHQT 130137E | Academic English 1 | 3 |  |
|  | EHQT 230237E | Academic English 2 | 3 |  |
|  | EHQT 230337E | Academic English 3 | 3 |  |
|  | EHQT 230437E | Academic English 4 | 3 |  |
|  | EHQT 330537E | Academic English 5 | 3 |  |
|  | TEEN127131E | Technical English 1 | 2 |  |
|  | TEEN237231E | Technical English 2 | 3 |  |
|  | TEEN337330E | Technical English 3 | 3 |  |
|  | TEEN437433E | Technical English 4 | 3 |  |
|  |  | **Total** | **26** |  |

1. **Plan of Courses**

**Semester 1**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **No.** | **Course Code** | **Course name** | **Credits** | **Note** |
|
|  | LLCT150105E | Principles of Marxist-Leninism | 5 |  |
|  | LLCT230214E | Ho Chi Minh’s Ideology | 2 |  |
|  | INAT130130E | Introduction to Automobile Technology | 3 |  |
|  | MATH141601E | Calculus I | 4 |  |
|  | GCHE130603E | Fundamental Chemistry A1 | 3 |  |
|  | PHED110513E | Physical Education 1 | 0 | 1 |
|  | GDQP008031E | Military Education | 0 | 10 |
|  | EHQT 130137E | Academic English 1 | 0 | 3 |
|  | EHQT 230237E | Academic English 2 | 0 | 3 |
|  |  | **Total** | **17** |  |

**Semester 2**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **No.** | **Course Code** | **Course name** | **Credits** | **Note** |
|
|  | LLCT120314E | Vietnamese Communist Party Policy of Revolution | 3 |  |
|  | MATH141701E | Calculus II | 4 |  |
|  | IPRM121585E | MATLAB programming language | 2 |  |
|  | PHYS 130402E | Principles of Physics 1 | 3 |  |
|  | PHED110613E | Physical Education 2 | 0 | 1 |
|  | EDDG240120E | Descriptive Geometry & Technical Drawing | 4 |  |
|  | TEEN127131E | Technical English 1 | 0 | 2 |
|  | EHQT 230337E | Academic English 3 | 0 | 3 |
|  |  | **Total** | **16** |  |

**Semester 3**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **No.** | **Course Code** | **Course name** | **Credits** | **Note** |
|
|  | THME230721E | Theoretical Mechanics | 3 |  |
|  | MATH141801E | Calculus III | 4 |  |
|  | PHED130715E | Physical Education 3 (Elective) | 0 | 1 |
|  | *INSO321005E* | *Introduction to Sociology* | *2* | *Select 1 course* |
|  | *PLSK320605E* | *Planning Skill* | *2* |
|  | *INLO220405E* | *Introduction to Logics* | *2* |
|  | THER222932E | Thermal Engineering | 2 |  |
|  | EPNS130406E | Enterprise Start-up | 2 |  |
|  | *ULTE121105E* | *Learning Methods in University* | *2* | *Select 1 course* |
|  | *SYTH220505E* | *Systematic Thinking* | *2* |
|  | *PRSK320705E* | *Presentation Skill* | *2* |
|  | TEEN237231E | Technical English 2 | *0* | 3 |
|  |  | **Total** | **15** |  |

**Semester 4**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **No.** | **Course Code** | **Course name** | **Credits** | **Note** |
|
|  | AMME131529E | Applied Mathematics in Engineering | 3 |  |
|  | AMIC320133E | Applied of Microcontroller | 2 |  |
|  | STMA230521E | Strength of Materials | 3 |  |
|  | ICEP330330E | Internal Combustion Engine Principle | 3 |  |
|  | AEEE230833E | Automotive Electrical and Electronic Engineering | 3 | (2+1) |
|  | *ENMA220126E* | *Engineering Materials* | *2* | *Select 1 course* |
|  | *METE320126E* | *Metal Technology* | *2* |
|  | EHQT230437E | Academic English 4 | *0* | 3 |
|  |  | **Total** | **16** |  |

**Semester 5**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **No.** | **Course Code** | **Course name** | **Credits** | **Note** |
|
|  | TMMP230220E | Theory Of Machine And Machine Design  | 3 |  |
|  | ATMT320831E | Automatic Transmission and Transaxle | 2 |  |
|  | *FLUI220132E* | *Fluid Mechanics (FME)* | *2* | *Select 1 course* |
|  | *HEAT220332E* | *Heating Transfer* | *2* |
|  | PICE331830E | Practice of Internal Combustion Engine | 3 |  |
|  | THOV330131E | Theory of Vehicle | 3 |  |
|  | PMDT321131E | Practice of Manual Drivetrain | 2 |  |
|  | IECT330830E | Engine Control Technology | 3 |  |
|  | TEEN337331E | Technical English 3 | 0 | 3 |
|  |  | **Total** | **18** |  |

**Semester 6**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **No.** | **Course Code** | **Course name** | **Credits** | **Note** |
|
|  | PEMS331130E | Practice of Engine Management System | 3 |  |
|  | PAES321133E | Practice of Automotive Electrical and Electronic | 2 |  |
|  | *ICEC330430E* | *Internal Combustion Engine Calculation* | *2* | *Select 1 course* |
|  | *VEDE330231E* | *Vehicle Design* | *2* |
|  | PBSS331231E | Practice of Automotive Braking, Suspension and Steering System | 3 |  |
|  | PODE321330E | Practice of Diesel Engine | 2 |  |
|  | AUPE330933E | Automotive Powertrain Electronics | 3 |  |
|  | *CAES320530E* | *Computer Application in Engine Simulation* | *2* | *Select 1 course* |
|  | *CAVS320831E* | *Computer Application in Vehicle Simulation* | *2* |
|  | *CAMC320533E* | *Computer Application in measurement and Control* | *2* |
|  | ASMA220230E | Automotive Service Management | 2 |  |
|  | EHQT330537E | Academic English 5 | 0 | 3 |
|  |  | **Total** | **19** |  |

**Semester 7**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **No.** | **Course Code** | **Course name** | **Credits** | **Note** |
|
|  | PABE331233E | Practice of Automotive Body Electrical Systems | 3 |  |
|  | VNOV320431E | Vehicle Stability and NVH | 2 |  |
|  | POAD321230E | *Practice of Automotive Diagnosis* | *2* | *Select 1 course* |
|  | *PBPA321331E* | *Practice of Automotive Body and Paint* | *2* |
|  | *IQMA220205E* | *Introduction to Quality Management* | *2* | *Select 1 course* |
|  | BUAD220305E | *Business Administration* | *2* |
|  | *GEEC220105E* | *General Economics* | *2* |
|  | HEVT321033E | Hybrid Electric Vehicle Technology | 2 |  |
|  | ASCS331433E | Automotive Safety and Convenience Systems | 3 |  |
|  | *ADRT335031E* | *Automotive Diagnosis and Repair Technology* | *2* | *Select 1 course* |
|  | *AFIV*320830E | *Alternative Energy for Vehicle* | *2* |
|  | *EAEN320630E* | *Theory of Engine and Automotive Experiment* | *2* |  |
|  | TEEN437431E | *Technical English 4* | *0* | 3 |
|  |  | **Total** | **16** |  |

**Semester 8**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **No.** | **Course Code** | **Course name** | **Credits** | **Note** |
|  | PRGR 422130E | Industry Internship | 3 |  |
|  | GRTH4102030E | Graduation Thesis | 10 |  |
|  |  | **Total** | **13** |  |

Plan of Courses

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **No.** | **Code** | **Course name** | **Credits** | **Semester** | **Note** |
| **1** | **2** | **3** | **4** | **5** | **6** | **7** | **8** |
| 1. 1
 | LLCT150105E | Principles of Marxist-Leninism | 5 | 5 |  |  |  |  |  |  |  |  |
|  | LLCT230214E | Ho Chi Minh’s Ideology | 2 | 2 |  |  |  |  |  |  |  |  |
|  | INAT130130E | Introduction to Automobile Technology | 3 | 3 |  |  |  |  |  |  |  |  |
|  | MATH141601E | Calculus I | 4 | 4 |  |  |  |  |  |  |  |  |
|  | GCHE130603E | Fundamental Chemistry A1 | 3 | 3 |  |  |  |  |  |  |  |  |
|  | PHED110513E | Physical Education 1 | 1 | 0 |  |  |  |  |  |  |  |  |
|  | GDQP008031E | Military Education | 10 | 0 |  |  |  |  |  |  |  |  |
|  | LLCT120314E | Vietnamese Communist Party Policy of Revolution | 3 |  | 3 |  |  |  |  |  |  |  |
|  | MATH141701E | Calculus II | 4 |  | 4 |  |  |  |  |  |  |  |
|  | IPRM121585E | MATLAB programming language | 2 |  | 2 |  |  |  |  |  |  |  |
|  | PHYS 130402E | Principles of Physics 1 | 3 |  | 3 |  |  |  |  |  |  |  |
|  | PHED110613E | Physical Education 2 | 1 |  | 0 |  |  |  |  |  |  |  |
|  | EDDG240120E | Descriptive Geometry & Technical Drawing | 4 |  | 4 |  |  |  |  |  |  |  |
|  | THME230721E | Theoretical Mechanics | 3 |  |  | 3 |  |  |  |  |  |  |
|  | MATH141801E | Calculus III | 4 |  |  | 4 |  |  |  |  |  |  |
|  | PHED130715E | Physical Education 3 (Elective) | 1 |  |  | 0 |  |  |  |  |  |  |
|  | *INSO321005E* | *Introduction to Sociology* | *2* |  |  | *2* |  |  |  |  |  | *Choose 1* |
|  | *PLSK320605E* | *Planning Skill* | *2* |  |  | *2* |  |  |  |  |  |
|  | *INLO220405E* | *Introduction to Logics* | *2* |  |  | *2* |  |  |  |  |  |
|  | THER222932E | Thermal Engineering | 2 |  |  | 2 |  |  |  |  |  |  |
|  | EPNS130406E | Enterprise Start-up | 2 |  |  | 2 |  |  |  |  |  |  |
|  | *ULTE121105E* | *Learning Methods in University* | *2* |  |  | *2* |  |  |  |  |  | *Choose 1* |
|  | *SYTH220505E* | *Systematic Thinking* | *2* |  |  | *2* |  |  |  |  |  |
|  | *PRSK320705E* | *Presentation Skill* | *2* |  |  | *2* |  |  |  |  |  |
|  | AMME131529E | Applied Mathematics in Engineering | 3 |  |  |  | 3 |  |  |  |  |  |
|  | AMIC320133E | Applied of Microcontroller | 2 |  |  |  | 2 |  |  |  |  |  |
|  | STMA230521E | Strength of Materials | 3 |  |  |  | 3 |  |  |  |  |  |
|  | ICEP330330E | Internal Combustion Engine Principle | 3 |  |  |  | 3 |  |  |  |  |  |
|  | AEEE230833E | Automotive Electrical and Electronic Engineering | 3 |  |  |  | 3 |  |  |  |  | (2+1) |
|  | *ENMA220126E* | *Engineering Materials* | *2* |  |  |  | *2* |  |  |  |  | *Choose 1* |
|  | *METE320126E* | *Metal Technology* | *2* |  |  |  | *2* |  |  |  |  |
|  | TMMP230220E | Theory Of Machine And Machine Design  | 3 |  |  |  |  | 3 |  |  |  |  |
|  | ATMT320831E | Automatic Transmission and Transaxle | 2 |  |  |  |  | 2 |  |  |  |  |
|  | *FLUI220132E* | *Fluid Mechanics (FME)* | *2* |  |  |  |  | *2* |  |  |  | *Choose 1* |
|  | *HEAT220332E* | *Heating Transfer* | *2* |  |  |  |  | *2* |  |  |  |
|  | PICE331830E | Practice of Internal Combustion Engine | 3 |  |  |  |  | 3 |  |  |  |  |
|  | THOV330131E | Theory of Vehicle | 3 |  |  |  |  | 3 |  |  |  |  |
|  | PMDT321131E | Practice of Manual Drivetrain | 2 |  |  |  |  | 2 |  |  |  |  |
|  | IECT330830E | Engine Control Technology | 3 |  |  |  |  | 3 |  |  |  |  |
|  | PEMS331130E | Practice of Engine Management System | 3 |  |  |  |  |  | 3 |  |  |  |
|  | PAES321133E | Practice of Automotive Electrical and Electronic | 2 |  |  |  |  |  | 2 |  |  |  |
|  | *ICEC330430E* | *Internal Combustion Engine Calculation* | *2* |  |  |  |  |  | *2* |  |  | *Choose 1* |
|  | *VEDE330231E* | *Vehicle Design* | *2* |  |  |  |  |  | *2* |  |  |
|  | PBSS331231E | Practice of Automotive Braking, Suspension and Steering System | 3 |  |  |  |  |  | 3 |  |  |  |
|  | PODE321330E | Practice of Diesel Engine | 2 |  |  |  |  |  | 2 |  |  |  |
|  | AUPE330933E | Automotive Powertrain Electronics | 3 |  |  |  |  |  | 3 |  |  |  |
|  | *CAES320530E* | *Computer Application in Engine Simulation* | *2* |  |  |  |  |  | *2* |  |  | *Choose 1* |
|  | *CAVS320831E* | *Computer Application in Vehicle Simulation* | *2* |  |  |  |  |  | *2* |  |  |
|  | *CAMC320533E* | *Computer Application in measurement and Control* | *2* |  |  |  |  |  | *2* |  |  |
|  | ASMA220230E | Automotive Service Management | 2 |  |  |  |  |  | 2 |  |  |  |
|  | PAES321133E | Practice of Automotive Body Electrical Systems | 3 |  |  |  |  |  |  | 3 |  |  |
|  | VNOV320431E | Vehicle Stability and NVH | 2 |  |  |  |  |  |  | 2 |  |  |
|  | POAD321230E | *Practice of Automotive Diagnosis* | *2* |  |  |  |  |  |  | *2* |  | *Choose 1* |
|  | *PBPA321331E* | *Practice of Automotive Body and Paint* | *2* |  |  |  |  |  |  | *2* |  |
|  | *IQMA220205E* | *Introduction to Quality Management* | *2* |  |  |  |  |  |  | *2* |  | *Choose 1* |
|  | BUAD220305E | *Business Administration* | *2* |  |  |  |  |  |  | *2* |  |
|  | *GEEC220105E* | *General Economics* | *2* |  |  |  |  |  |  | *2* |  |
|  | HEVT321033E | Hybrid Electric Vehicle Technology | 2 |  |  |  |  |  |  | 2 |  |  |
|  | ASCS331433E | Automotive Safety and Convenience Systems | 3 |  |  |  |  |  |  | 3 |  |  |
|  | *ADRT330331E* | *Automotive Diagnosis and Repair Technology* | *2* |  |  |  |  |  |  | *2* |  | *Choose 1* |
|  | *AFIV320830E* | *Alternative Energy for Vehicle* | *2* |  |  |  |  |  |  | *2* |  |
|  | *EAEN320630E* | *Theory of Engine and Automotive Experiment* | *2* |  |  |  |  |  |  | *2* |  |
|  | ININ432130E | Graduation Internship | 3 |  |  |  |  |  |  |  | 3 |  |
|  | GRAT402424E | Graduation Thesis | 10 |  |  |  |  |  |  |  | 10 |  |
| **Total** | **130** | **17** | **16** | **15** | **16** | **18** | **19** | **16** | **13** |  |

1. **Brief description of course contents**
2. **FOUNDATION SCIENCE COURSES**
3. **Introduction of Automotive Technology Credit: 3**

*Distribution of learning time: 3 (3, 0, 6)*

*Prerequisite:*

*Course Description:* The content of the course includes the academic knowledge about:

Introduction of Automotive Technology course is designed to help the first-year students who can get the acquainted with the new academic environment and successfully advance toward the path of becoming an engineer or a bachelor at the University of Technical Education HCMC.

This course equips students with career orientations, and soft skills as well as professional ethics.

***Textbook:***

1. Do Van Dung, Introduction to Automobile engineering technology, HCM University of Technology and Education, 2012

***Reference book:***

1. Saeed Moaveni, *Engineering fundamentals-An introduction to engineering*, Thomson, 2007.
2. UNESCO Report, *Engineering: Issues Challenges and Opportunities for development*, UNESCO Publishing, 2010.
3. **Calculus I Credits: 3**

*Distribution of learning time:* ***3 (*3/0/6)**

*Prerequisites: None*

*Former subjects of condition: None*

*Course Description*: This course helps students review the general and advanced mathematical knowledge: Cardinality of a set: rational numbers, real numbers, complex numbers. Limit: function, limit of a function, continuous function. Differential calculus: derivative, differential, Taylor-Maclaurin expansion, the survey on function, curve in polar coordinates. Calculus of single variable: volume fraction uncertainty, definite integrals, generalized integrals. Chain: Chain number, string functions, power series, Taylor-Maclaurin sequence, Fourier series, Fourier expansion, trigonometric series.

***Textbook:***

1. K. Smith, M. Strauss and M. Toda –Calculus - 6th National Edition–Kendall Hunt.
2. **Calculus II Credit: 3**

*Distribution of learning time:* ***3 (*3/0/6)**

*Prerequisites: None*

*Former subjects of condition:* **Calculus I**

*Course Description*: This course provides the learnerwith contents: Matrix-determinant: the matrix, the form of matrix, inverse matrix, determinants, matrix classes. System of Linear Equations: linear systems, Cramer rule, Gauss method, homogeneous system. Space Vector: Space Vector, subspace, linear independence, linear dependence, basis, dimension, Euclidean space. Diagonal matrix-quadratic form: eigenvalues, eigenvectors, private space, diagonal matrix, quadratic form, canonical form, the surface level 2. Differential calculus of function of several variables: function of several variables, derivative, differential, extreme of function of several variables, calculus applications in geometry in space.

***Textbook:***

1. K. Smith, M. Strauss and M. Toda –Calculus - 6th National Edition–Kendall Hunt.
2. **Calculus III Credit: 3**

*Distribution of learning time:* ***3 (*3/0/6)**

*Prerequisites: None*

*Former subjects of condition:* **Calculus II**

*Course Description*: This course provides the learner with contents: multiple integral: double integral, application for calculated area of flat domain, calculate the surface area, object volume, triple integrals, and applications for the object volume. Line integral: lineintegral type one and applications,line integral type one and applications, Green formula, condition of line integral does not depend on integrating line. Surface integral: Integral surface type one, type two, the Ostrogratskiformula, vector field, flux and divergence, vector format of Ostrogratski formula, Stokes formula, circulation and vortex vector, vector format of Stokes formula.

***Textbook:***

1. K. Smith, M. Strauss and M. Toda –Calculus - 6th National Edition–Kendall Hunt.
2. **Principles of Physics 1 Credit: 3**

*Distribution of learning time:* ***3(*2/1/4)**

*Prerequisites: None*

*Former subjects of condition: None*

*Course description:* This course provides the learnerwith contents: the mechanics: point dynamics, the law of conservation, solid motion. Thermodynamics: kinetic molecular theory, principles of Thermodynamics I, principles of Thermodynamics II. Electricity and magnetism: electric field, magnetic, variability of electrical magnetic field.

***Textbook:***

1. D. Hallyday, R. Resnick, J. Walker, Fundamentals of Physics, John Willey & Sons, 1999.
2. **General Chemistry for Engineers (GCHE130603) Credits: 03**

*Course workload: 3(3/0/6)*

*Prerequisites: None*

*Course description:* This course provides general chemistry necessary for engineering and science. This course covers fundamentals of electronic structures of atoms, relationship of electron and atomic properties, geometric configuration of the molecule, the polarity of the molecules, link of the physical molecules, a preliminary study on the physical and chemical properties of inorganic substances and their structures.

***Text book:***

1. Lawrence S. Brown, ***Chemistry for Engineering Students***, Brooks/Cole, Cengage Learning, 2nd edition, 2011
2. Steven S. Zumdahl, ***Chemistry***, Brooks/Cole, Cengage Learning, 9th edition, 2014
3. **FUNDAMENTAL AUTOMOTIVE ENGINEERING COURSES**
4. **Descriptive Geometry and Engineering Drawing Credits: 04**

*Distribution of learning time:* ***4 (3, 1, 6)***

*Prerequisite: None*

*Course description:* This course provides students fundamental theory of engineering drawing, including: engineering drawing standards, basic drawing skills and drawing principles, methods of representation, orthographic projection; and cultivates the abilities of writing and reading engineering drawing.

***Textbooks:***

1. David A. Madsen, David P. Madsen, Engineering Drawing and Design, 6rd edition, Cengage Learning, 2016

2. K.L. Narayana, P. Kannaiah, K. Venkata Reddy, Machine drawing, 3rd edition, New Age International Publishers

1. **Theoretical Mechanics Credits: 03**

*Distribution of learning time: 3 (3, 0, 6)*

*Prerequisite: None*

*Course description:* This course provides fundamental knowledge of mechanical engineering. In this course, following topics will be covered:

* *Statics*: statics axioms, force, connection, reaction, system analysis.
* *Kinematics*: study the motion of points, objects, translation and rotation, kinematic analysis.
* *Dynamics*: physical laws, theorems of dynamics, D’Alambert principles, Lagrange equations.

***Textbooks:***

1. R. C. HIBBELER. Engineering Mechanics, Twelfth Edition. PRENTICE HALL, 2010.

2. J. L. Meriam, L. G. Kraige. Engineering Mechanics, Seventh Edition. John Wiley &

Sons, Inc, 2006.

1. **Strength of Materials Credits: 03**

*Distribution of learning time: 3 (3, 0, 6)*

*Prerequisite:*

*Course description:* This course introduces students to fundamental knowledge of strength of materials; methods of calculating the stress, strain in mechanical components, structural members under loading, its load capacity and deformations.

***Textbooks:***

1. Hibbeler. Mechanics of Materials, 9th Edition, Prentice Hall, 2013.

2. J. L. Meriam, L. G. Kraige. Engineering Mechanics, Seventh Edition. John Wiley &

Sons, Inc, 2006.

1. **Theory of Machine and Machine Design Credits: 03**

*Distribution of learning time: 3 (3, 0, 6)*

*Prerequisite:*

*Course description:* This course study structures, working principles and calculating methods of kinematic, dynamic designs of machine and mechanism, standard mechanical joints and components. At the end of the course, students can independently solve calculating problems and machine design problems.

***Text books:***

* + - 1. R. S. Khurmi, J.K. Gupta, Theory Of Machines, Eurasia Publishing House, 2005e
			2. Joseph Edward Shigley, John Joseph Uicker Jr, Theory of Machines and Mechanism, Publisher Oxford Press, Third Edition
1. **Thermal Engineering Credits: 02**

*Distribution of learning time: 2 (2, 0, 4)*

*Prerequisite:*

*Course description:* This course provides a fundamental knowledge of thermal dynamics and heat transfer, introduces student to common thermal instruments such as: dryer/dehydrator, steam boiler, heat exchanger.

 ***Textbooks:***

J. P. Holman, Heat transfer, Ninth Edition, McGraw-Hill, New York, 2002

1. **Automotive Electrical and Electronics Engineering Credits: 3**

*Distribution of learning time: 3(3:0:6)*

*Prerequisite:*

*Course description:* This course provides the knowledge of the automotive electrical and electronic components, the basic application circuit in the automotive electrical systems and automatic control system. Working principles, rules and basic laws of electricity and electromagnetism. The principle of operation, characteristics, schematic and construction calculate basic electrical circuits such as amplification circuits, switches, circuit power, motor, solenoid...

*Outcomes:*

- Understand the principles and basic rules of the electronic components and electromagnetic phenomena.

- Analysis of the basic kinds of electronic circuits.

- Calculation, simulation and assembly of electrical networks in automotive applications.

***Textbooks:***

1. James D. Halderman, Diagnosis and Troubleshooting of Automotive Electrical, Electronic, and Computer Systems, 6th Edition, Prentice Hall Publishing. ISBN-10:0132551551 ISBN-13: 978-0132551557
2. Tom Denton, *Automobile electrical and electronic system 3rd edition*, Elsevier 2004*.*

***Reference book:***

Hoàng Ngọc Văn, *Kỹ thật điện tử***,** Trường ĐH SPKT Tp. HCM

1. **Applied Microcontroller Credit: 02**

*Distribution of learning time: 2 (2, 0, 4)*

*Prerequisite:*

*Course description*: This course provides the knowledge of the hardware structure of the microcontroller (the internal memory, timers, and some special functions when using interrupts). This course also provides the method in programming.

*Outcomes:*

 Understand the structure of processor control systems.

Designing the microcontroller application circuits.

Programming for microcontroller to control the peripherals.

***Textbooks:***

1. Atmel Corporation, AVR Microcontroller, 2005.

 2. Pavel Hai duc anh HP InfoTech S.R.L., Code Vision AVR, 1998.

***Reference material:***

 https://www.arduino.cc/

1. **Fluid Mechanics Credits: 02**

*Distribution of learning time: 2 (2, 0, 4)*

*Prerequisite:*

*Course description:* This course provides fundamental knowledge of fluid statics, kinematics and dynamics, analysis of ideal fluid motion and its practical application.

***Textbooks:***

Versteeg, H.K. and Malalasekera, W. An introduction to computational fluid dynamics: the finite volume method, 2nd edition, 2007

1. **Materials Science Credits: 2**

*Distribution of learning time: 2 (2, 0, 4)*

*Prerequisite:*

 *Course description:* the subject provides students:

* General knowledge of properties of metal and metallic alloy, metallic materials in manufacturing, general knowledge of heat treating to manipulate mechanical properties of metallic materials.
* Fundamentals of structure and properties of polymer, composite materials, rubber…

***Textbooks:***

Materials Science and Engineering: An Introduction, 8th Edition, Williams D. Callister, Jr., David G. Rethwisch, John Wiley & Sons, Inc.

1. **ADVANCED AUTOMOTIVE ENGINEERING COURSES**
2. **Internal Combustion Engine Principles Credit: 03**

 *Distribution of learning time: 3 (3, 0, 6)*

 *Prerequisite:*

 *Course description:* the subject provides students the content of the course includes the academic knowledge about:

The course presents the knowledge of the operating principles of the internal combustion engine. The basic physical and chemical processes occur in the engine, the thermodynamic cycle, ideal and actual work cycle of the engine, the theory of combustion processes, the methods reduce emissions in the engine. The course is also presents the parameters characterize of working process in internal combustion engines, the effect factors, the technical and economic standards and the characteristics of the engine.

***Textbook:***

Heywood, *Internal Combustion Engine Fundamental,* Mc Graw-Hill - 1998.

***Reference books:***

1. Willard W. Pulkrabek, *Engineering Fundamentals of the Internal Combustion Engine*, University of Wisconsin.
2. John, L. Lumley, Engines - An introduction, Cambridge University Press, 2009
3. **Practice of Internal Combustion Engine Credit: 03**

*Distribution of learning time: 3 (0, 3, 6)*

*Prerequisite:*

 *Course description:* Course includes practical technical skills. Content emphasizes the 720 degree power cycle and the dynamics of engine operation, design. Laboratory experience consists of engine disassembly, component design study, inspection and measurement of components and engine assembly techniques.

***Textbook:***

Duffy, J. E, *Auto engine repair (5th ed.)*, Tinley Park, IL: The Goodheart-Wilcox Company, INC, 2010

1. **Practice of Engine Management System Credit: 03**

*Distribution of learning time: 3 (0, 3, 6)*

*Prerequisite*:Internal Combustion Engine Principles, Practice of Internal Combustion Engine

*Course description:* Laboratory experience will provide the opportunity to use standard electronic diagnostic tools, specialized equipment, and computerized diagnostic tools used for engine performance diagnosis

***Textbook:***

Halderman, J. D, *Diagnosis & Troubleshooting of Automotive Electrical Electronic & Computer System (6th Edition)*, Upper Saddle River, NJ: Pearson Education. [ISBN 13: 978-0132551557], 2011.

1. **Engine Control Technology Credit: 03**

 *Distribution of learning time: 3 (3, 0, 6)*

 *Prerequisite:*

*Course description* Course consists of a specialized study of automotive computerized engine control electronics and electrical circuits. Lectures will focus on the operational characteristics, application, and diagnosis of electronic and computerized engine control systems. Particular emphasis will be placed on electronic components and operation for the diagnosis of engine performance problems. Discussion topics will include operational strategies, sensor inputs, actuators, ignition systems, and fuel injection systems.

***Textbook:***

Halderman, J, *Automotive fuel and Emissions Control System (4th Edition)*, Upper Saddle River, NJ: Pearson Education. [ISBN-10: 0-13-379949-2; ISBN-13: 978-0-13-379949-1], 2015.

1. **Theory of Vehicles Credit: 3**

*Distribution of learning time: 3 (3, 0, 6)*

*Prerequisite:*

*Course description:* This course provides students with the fundamental knowledge of the kinematics, dynamics of vehicles in performances on straight and curved roads, braking dynamics, severability, stability of vehicles and fuel economic of vehicles. The theoretical conclusions are used as the basis for solving problems, such as: assess tractive properties of a vehicle, use a vehicle effectively in certain conditions, design and refine new models.

***Text book:***

Vehicle Dynamics and Control Second Edition, Rajesh Rajamani, Springer New York Dordrecht Heidelberg London, ISSN 0941-5122

1. **Automotive Powertrains Electronics Credit: 03**

*Distribution of learning time: 3 (3, 0, 6)*

*Prerequisite:*

*Course description*: This course provides the knowledge of the automotive electrical and electronic systems in which it details the diagram, structure, working principles, characteristics… of the system. This content includes batteries, starting systems, charging systems, ignition systems, engine control systems, immobilizer systems, basic powertrain control systems.

Outcomes:

- Understand the principles of the automotive electrical and electronic systems, powertrain control systems.

- Analysis the data from the automotive electrical and electronic systems, powertrain control systems.

- Computing the parameters and simulating the operation of the systems.

***Texbook:***

1. Willian B. Ribbens, *Understanding automotive electronics 7th edition*, Elsevier 2012.

2. Ali G Ulsoy\_ Huei Peng\_ Melih CÌ§akmakci-Automotive control systems-Cambridge University Press (2012)

***Reference book:***

Đỗ Văn Dũng, *Điện động cơ và điều khiển động cơ*, NXB Đại học Quốc gia 2013.

1. **Practice of Manual Drivetrain Credit: 02**

*Distribution of learning time: 3 (0, 3, 6)*

*Prerequisite:*

*Course description*: This course provides the basic knowledge about powertrain system include clutch assemblies, drive axles, four-wheel drive transfer cases. Lectures focus on the basic theory of operation and diagnostics of the automotive drivetrain. Laboratory experience provides the opportunity to study approved inspection, maintenance, and diagnostic procedures.

***Text book:***

Manual Drivetrains and Axles (7th Edition), James D. Halderman, Pearson 2014-03-17 ISBN-10: 0133515044, ISBN-13: 9780133515046

1. **Automatic Transmission and Transaxle Credit: 02**

*Distribution of learning time: 2 (1, 1, 2)*

*Prerequisite:*

*Course description*: This course provides the basic knowledge about the structure, working principle of the automatic transmission and the basic methods of calculation of hydraulic torque converter, kinematics and dynamics of planetary transmission. The methods, processes practical assembly, inspection and repair of components for automatic transmissions.

***Text book:***

Automatic Transmissions and Transaxles (6th Edition), James D. Halderman, Pearson 2014-05-10, ISBN-10: 0133516563, ISBN-13: 9780133516562

1. **Practice of Automotive Electrical and Electronic Systems Credit: 02**

*Distribution of learning time: 2 (0, 2, 4)*

*Prerequisite:*

*Course description*: This course provides the knowledge of the structure, working principles of the engines electrical and electronic systems. It also provides the method of assembly/disassembly, inspection, repair and diagnostic the cause of the failure on the systems.

*Outcomes:*

*-* Understand the structure of the engines electrical and electronic systems on vehicles.

- Analyze and evaluate the measured parameters.

- Assemble/disassemble, inspect and repair the systems on vehicles.

***Texbook:***

Willian B. Ribbens, *Understanding automotive electronics 7th edition*, Elsevier 2012.

***Reference book:***

 Lê Thanh Phúc, *Thực tập điện ô tô,* Trường Đại học SPKT TP. HCM

Nguyễn Văn Thình, *Thực tập hệ thống điện ô tô,* Trường Đại học SPKT TP. HCM

1. **Theory of Engine and Automotive Experiment Credit: 02**

*Distribution of learning time: 2 (2, 0, 4)*

*Prerequisite:*

*Course description:* The content of the course includes the academic knowledge about:

The course represents the basic knowledge of testing internal combustion engines. Thereby, students will have the knowledge of evaluating an engine on: engine performance, quality of emissions, fuel consumption. The course also presents the general issue of how to define the indicators to assess an engine such as power, torque, fuel consumption and introducing the test equipments for these criteria. Also, the course refers to the issues of designing and operating a engine testing laboratory

***Textbooks:***

1. Michael Plint and Anthony Martyr, *Engine testing theory and practice,* Butterworth-Heinermann Ltd 2006
2. Richard D. Atkins, *An Introduction to Engine Testing and Development ,* Warrendale, Pa, 2009.
3. **Practice of Automotive Diagnostic Credit: 02**

*Distribution of learning time: 2 (0, 2, 4)*

*Prerequisite:*

 *Course description:* An in-depth study of electronic engine controls and emission systems. Lectures focus on fuel analysis, advanced diagnostics, legislative regulations and new technologies related to engine controls and emission systems. Lab activities include the use of advanced diagnostic tools such as oscilloscopes, scan tools, exhaust gas analyzers, and chassis dynamometer.

***Textbook:***

 Automotive Fuel and Emissions Control Systems, Third Edition; Authors: James D Halderman and Jim Linder; Publisher: Pearson Prentice Hall; Copyright: 2012; ISBN: 978-0-13-254292-0

***Reference book:***

Tom Denton, Advance Automotive Fault Diagnosis, Second Edition, Published by Elsevier, 2016

1. **Practice of Automotive Body and Paint Credit: 02**

*Distribution of learning time: 2 (0, 2, 4)*

*Prerequisite:*

*Course description:* This course provides the basic knowledge of automobile structure and impact effective to the body and paint of vehicle. Besides, this course also support to students professional skills such as MIG welding, body repair process and painting techniques.

***Textbook:***

The Repair of Vehicle Bodies, [Andrew Livesey](https://www.google.com.vn/search?hl=vi&tbo=p&tbm=bks&q=inauthor:%22Andrew+Livesey%22&source=gbs_metadata_r&cad=7), Routledge, 2013, ISBN 1135120498, 9781135120498

1. **Practice of Automotive Braking, Suspension and Steering System Credit: 03**

*Distribution of learning time: 3 (0, 3, 6)*

*Prerequisite:* Practice of automotive powertrains system

*Course description*: This course provides the basic knowledge of automobile suspension, steering and brakes. Besides, this course also support to students professional skills such as automotive suspension, steering and brakes diagnosis and repair techniques. Laboratory experience provides students the opportunity to use computerized alignment, wheel balance and vibration correction equipment

***Textbook:***

Automotive Chassis Systems, 4th, 5th or 6th Edition, James Halderman, Pearson Hall Publishing ISBN 13: 9780132747752

1. **Practice of Diesel Engine Credit: 02**

*Distribution of learning time: 2 (0, 2, 4)*

*Prerequisite:*

 *Course description:* This course is an in-depth study of Diesel Fuel Systems, Electronic Engine Management Systems and Diesel Emission Control Systems. Lectures focus on fuel systems analysis, advanced diagnostics, legislative regulations and new technologies related to engine controls and emission systems. Laboratory activities include the use of advanced diagnostic tools such as oscilloscopes, scan tools, exhaust gas analyzers, and chassis dynamometer.

***Textbook:***

Toyota, *Diesel engine*, vol 6, step 2

1. **Hybrid Electric Vehicle Technology Credit 02**

*Distribution of learning time: 2 (2, 0, 4)*

*Prerequisite:*

*Course description*: This course provides the basic knowledge of the electric vehicles, hybrid electric vehicles. This content includes renewable energy sources and techniques to optimize the process of managing and using energy in electric vehicles, hybrid vehicles.

Outcomes:

- Understand the applicability of the renewable energy in the automotive industry, the structure and working principle of electric vehicles and hybrid electric vehicles

- Computing some basic parameters in the electric vehicles and hybrid electric vehicles technologies.

***Textbook:***

1. Mehrdad Ehsani, Yimin Gao, Ali Emadi, *Modern Electric, Hybrid Electric and Fuel Cell Vehicles,* Taylor & Francis, 2010

***Reference books:***

1. Electric Vehicles - Hybrid Electric Vehicles

2. Ali G Ulsoy\_ Huei Peng\_ Melih CÌ§akmakci-Automotive control systems-Cambridge University Press (2012)

1. **Vehicle Stability and NVH Credit 02**

*Distribution of learning time: 2 (2, 0, 4)*

*Prerequisite:*

*Course description*: This course provides the knowledge about the vibration, using one software to calculate and simulate the automotive noise and vibration. Besides, the course also includes techniques in diagnosing noise, vibration and harshness (NVH) concerns

***Text book:***

Automotive Chassis Systems by James D. Halderman, 6th edition

1. **Automotive Safety and Convenience Systems Credit: 03**

*Distribution of learning time: 3 (3, 0, 6)*

*Prerequisite:*

*Course description*: This course provides the knowledge of the body electrical systems, automotive safety and facility systems in which it details about the structure, working principles, the control circuits. This content includes power windows, power door locks, power seats, lighting, instrumentation, cruise control, supplemental restraints and air conditioning systems, collision warning systems, etc.

Outcomes:

- Understand the structure and working principle of the body electrical systems, automotive safety and facility systems.

- Analysis, calibrating the parameters and researching or developing the body electrical systems, safety and facility systems on vehicles.

***Textbook:***

1. James Halderman, Automotive Heating and Air Conditioning, 7th Edition, Prentice Hall Publishing.

***Reference books:***

1. PGS. TS. Đỗ Văn Dũng, *Hệ thống điện thân xe và điều khiển tự động ô tô*, ĐH SPKT TP. HCM 2004.

2. Tom Denton, *Automobile electrical and electronic system 3rd edition*, Elsevier 2004

1. **Practice of Automotive Body Electrical systems Credit: 03**

*Distribution of learning time: 3 (0, 3, 6)*

*Prerequisite:*

*Course description:* This course provides the knowledge of structures, working principles of the body electrical systems and automatic control systems on vehicles. It presents the assembly/diassembly methods, diagnosis, repair on the systems.

**Outcomes:**

* Understand the structure of the body electrical system and automatic control systems on vehicles.
* Analyze and evaluate the measured parameters.
* Assemble/disassemble, inspect and repair the systems on vehicles.

***Textbook:***

Tomy Candele [Automotive wiring and electrical systems](https://www.cartechbooks.com/automotive-wiring-and-electrical-systems.html) Publisher: CarTech ISBN: 9781932494877

***Reference books:***

Lê Thanh Phúc, *Thực tập điện ô tô II*

1. **Computing Application for Engine Design and Simulation Credit: 02**

*Distribution of learning time: 2 (2, 0, 4)*

*Prerequisite:*

*Course description:* The content of the course includes the academic knowledge about:

The course presents the basic knowledges and ability to apply some software applications such as Matlab, AVL boost, Advisor, CFD, ESP ... in designing the details of the engine systems and simulation of combustion processes, calculation the fuel consumption, engine performance and emissionsin internal combustion engines.

This is an integrated module that helping learners capable of using designing tools and simulations in automotive engineering technology.

***Textbook:***

O. BEUCHER and M. WEEKS, INTRODUCTION TO MATLAB® & SIMULINK, Third Edition, Inﬁnity Science Press LLC

***Reference book:***

Brian Hahn, D, T. Valentine, *Essential Matlab for Engineers and Scientists*, Elsevier, 2007.

1. **Computing Application for Automotive Measurement and Control Credit: 02**

*Distribution of learning time: 2 (2, 0, 4)*

*Prerequisite:*

*Course description:* This course provides the knowledge of theory and method for measurements the sensors on vehicles. The content details about automotive communication devices, theory and the method to control the actuators and automation systems on vehicles.

***Outcomes:***

* To know how to measure the signal from the sensors.
* Computing and converting the measurement data and control quantities

***Textbooks:***

1. LabVIEW Basic Core I, National Instruments Course.

2. LabVIEW for Everyone, Jeffrey Travis and [Jim Kring](http://www.amazon.com/Jim-Kring/e/B002BLWARM/ref%3Ddp_byline_cont_book_2) (1997).

1. **Computer Application in Vehicle Simulation Credit: 02**

*Distribution of learning time: 2 (2, 0, 4)*

 *Prerequisite:*

*Course description:* This course provide the basic knowledge about the construction methods of drawing on Catia software, including the building of 3D models, assembly and installation. Assembling a complete machine structure, production of 2D drawings, and simulation activities. This is part of intensive study method of using Catia software commands to an industry-standard design, creation of standard modules can be inherited in the next design phase, the instruction for learners according to the system design, the design team, quickly formed structure according to proposed ideas.

***Textbooks:***

1. Richard Cozzens , CATIA V5 Workbook , 2008
2. Kirstie plantenberg , An Introduction to Catia V5 Release 19 , 2009

***Reference book:***

Nguyễn Văn Đoàn, Thiết Kế Với Catia, ĐHSPKT TP.HCM, 2008

1. **Automotive Diagnostic and Repair Technology Credit: 02**

*Distribution of learning time: 2 (2, 0, 4)*

*Prerequisite:*

*Course description:* The course introduces students to some points of theme of degradation of technical actual states of parts, components, systems of motor vehicle. The course also provides understanding of diagnostic and repair procedures. The analysis of cause-effect relationship and critical thinking questions help students determine root causes of malfunctions of vehicle systems.

***Text book:***

[James D. Halderman](https://www.amazon.com/s/ref%3Ddp_byline_sr_book_1?ie=UTF8&text=James+D.+Halderman&search-alias=books&field-author=James+D.+Halderman&sort=relevancerank), Principles, Diagnosis, and Service (5th Edition), Pearson; 5 edition (January 15, 2015), ISBN-13: 978-0133994612

***Reference book:***

Nguyễn Văn Toàn – Giáo trình Công nghệ chẩn đoán, sửa chữa và kiểm định ô tô, ĐHSPKT TP.HCM, 2014.

1. **Automotive Alternative Energy Credit: 02**

*Distribution of learning time: 2 (2, 0, 4)*

*Prerequisite:*

*Course description:* Study of alternative fuel and energy systems, fuel delivery systems, alternative propulsion systems, and hybrid and alternative fueled propulsion. Study of energy conversion, battery design, fuel cells, and renewable and fossil fuel included. Environmental concerns with current legislative actions will be discussed.

***Reference books:***

1. Robert Q. Riley, *Alternative Cars in the 21st Century*, SAE International, 1994
2. Karl Kordesch, G. Simader, Fuel Cells and Their Applications, VCH, 1996.
3. M. Ehsani, Yimin Gao, et al, Modern Electronic, Hybrid Electric, and Fuel Cell Vehicles: Fundamentals, Theory, and Design, CRC Press.
4. C.E. Wyman, Handbook Bioethanol, Taylor & Francis, 1996
5. **Automobile Service Management Credit: 02**

*Distribution of learning time: 2 (2, 0, 4)*

*Prerequisite:*

*Course description:* An introduction to management of automotive retail fixed operations. A study of the automotive retail industry and environment, developing concepts and methods to improve customer satisfaction along with an increase in market penetration, profits and efficiency are emphasized. Planning of workflow control and human resource management will be included. This course is writing intensive and reflects the Colleges’ Communication-Across the-Curriculum initiative.

***Textbook:***

 ***Service advisor, A*utomotive dealership Institute, 2007**

1. **Internal Combustion Engine Calculation Credit: 03**

*Distribution of learning time: 2 (2, 0, 4)*

 *Prerequisite:*

 *Course Description:* The content of the course includes the academic knowledge about: Kinematics and dynamics of the structural mechanism based on piston - crankshaft - connecting rod in eccentric and concentric structure types. The course is also presents the knowledge of balancing the engine, calculations and testing the strength of materials of the key components of engine and the details of the subsystems in the internal combustion engine.

***Textbook:***

A. Kolchin, A. Demidov. *Design of Automotive Engines,* Mir Publishers Moscow, 1984

***Reference book***

- The Internal Combustion Engine in Theory and Practice, The M.I.T press (Massachusetts Institute of Technology), 1998.

 - Advanced Engine Technology, London Roal Institute of Technology 1999**.**

1. **Graduation Internship Credit: 03**

*Distribution of learning time: 3*

*Prerequisite:*

*Course description:* The content of the course includes the academic knowledge about: Designing a modern workshop, Process and management works of an agent, Methods of diagnosis, using the diagnostic tools. The process of maintenance and repair of the car damage, Design and working principles of the new systems on modern vehicles.

1. **Graduation Thesis Credit: 10**

*Distribution of learning time: 10*

*Prerequisite:*

*Course description:* Graduation thesis is the capstone project, also known as applied thesis, in order to solving a particular problem that has a relationship to student studying which can be chosen by themselves or with the help of their lecturers.

 Graduation thesis will help students systematize and synthesize the knowledge, skills and apply them in a scientific manner and creativity to solve a specific problem in practices. Students can improve thinking ability, the skills of placing the problems and solve problems independently and creatively.

**10. Campus Infrastructure**

Follow the Ministry of education and training’s regulations.

**10.1 Workshops and Laboratories:**

* Automotive Engine Laboratory
* Automotive Mechatronic Laboratory
* Automotive Chassis and Brake Laboratory
* Automotive Engine Practices Workshop
* Automotive Chassis Practices Workshop
* Automotive Electricity Practices Workshop
* Automotive Body and Painting Practices Workshop

**10.2 Library, Website**

* University’s Library
* Faculty’s Library
* Faculty’s Website

**11. PROGRAM GUIDE**

- Credit hour is calculated as:

 1 credit = 15 lecture hours

 = 30 laboratory hours

= 45 hours practice

 = 45 hours self -study

 = 90 workshop hours.

 = 45 hours for project, thesis.

* Graduation thesis: conduct a research project to solve specific problems related to the major.

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