**MINISTRY OF EDUCATION & TRAINING**

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

**UNDERGRADUATE PROGRAM**

**AUTOMOTIVE ENGINEERING TECHNOLOGY**

(Promulgating the Dicision No. 1878/QĐ-ĐHSPKT-ĐT on Oct 30, 2017 of the President of Hochiminh city University of Technology and Education)

(Attaching the Circular No. 23 /2014/TT- BGDĐT on July 18, 2014 of the Minister of Ministry of Education and Training)

Major name: AUTOMOTIVE ENGINEERING TECHNOLOGY

Level of training: Undergraduate

Major code: 52510205

Types of trainning: High quality

**(Applying for high quality training course from 2019)**

**Tp. Hồ Chí Minh, 2019**

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

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**UNDERGRADUATE PROGRAM**

**Education Program: AUTOMOTIVE ENGINEERING TECHNOLOGY**

**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 Graduation

**3. Grading Scale, Curriculum and Graduation Requirements**

**Grading Scale:** 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

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

**Program Goals**

After completing this training course, the students should be able to have basic scientific knowledge, fundamental knowledge, specialised knowledge of automobile major, analysis capability, solve problem skills andsolutions 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, ensure national defense, security and international integration.

**Program Objectives**

PO1. Knowledge and technical arguments.

PO2. Developing the capacity to explore knowledge, system thinking and solve automotive technical specialized issues.

PO3. Have working skills

PO4. Develop skills of forming ideas, designing, implementing and operating systems in the field of automotive engineering technology in accordance with social needs.

**Program outcomes**

|  |  |  |
| --- | --- | --- |
| **Symbol** | **Expected Learning Outcomes** | **Competence level** |
|  | **KNOWLEDGE AND TECHNICAL ARGUMENTS** |  |
| **1.1** | Application of basic knowledge of mathematics and natural sciences in engineering. | **3** |
| **1.2** | Application of basic and specialized knowledge in the field of automotive engineering technology | **3** |
| **1.3** | Application of expertise in designing, calculating, testing and diagnosing automotive systems or managing business, automotive services | **3** |
|  | **PERSONAL SKILLS AND PROFESSIONAL SKILLS** |  |
| **2.1** | Analysis, explanation and argument to solve automotive technical problems | **4** |
| **2.2** | Experiment and explore knowledge of automotive engineering issues | **4** |
| **2.3** | The ability to think and Systemic thinking in automotive engineering issues | **3** |
| **2.4** | Having professional and managerial skills to improve operational efficiency in the automotive major | **3** |
| **2.5** | Having professional ethics, a sense of environmental protection and professional working manner. | **3** |
|  | **COMMUNICATION AND TEAMWORKING SKILLS** |  |
| **3.1** | Creative skills and entrepreneurship | **3** |
| **3.2** | Ability to work in groups and lifelong learning | **3** |
| **3.3** | Communication skills and use specialized English | **3** |
|  | **ESTABLISHING IDEAS, DESIGN, IMPLEMENTATION, AND OPERATION IN THE CONTEXT OF ENTERPRISES, SOCIAL AND ENVIRONMENT - CREATIVE PROCESS** |  |
| **4.1** | Awareness and analysis are outside the social context and businesses | **4** |
| **4.2** | Able to formulate ideas about vehicle systems | **4** |
| **4.3** | Capable of calculating, designing, simulating and operating the components of automotive systems | **5** |
|  | **EXPANSION OF EXPECTED LEARNING OUTCOMES** |  |
| **4.4** | Able to lead, work in groups and solve related technical issues in the automotive industry | **3** |
| **4.5** | Knowledge entrepreneurship, business in the automotive major | **3** |

**Capacity scale**

|  |  |  |
| --- | --- | --- |
| **Competence level** | | **Short description** |
| 0.0 ≤ Level ≤ 1.0 | Basic | Remember: Students memorize / recognize / recall knowledge by actions such as definition, repetition, listing, identification, identification, ... |
| 1.0 < Level ≤ 2.0 | Satisfaction | Understand: Students create their own knowledge from documents, knowledge by actions such as explanation, classification, illustration, reasoning, ... |
| 2.0 < Level ≤ 3.0 | Application: Students implement / apply knowledge to create products such as models, real objects, simulation products, reports, ... |
| 3.0 < Level ≤ 4.0 | Proficiency | Analysis: Students analyze materials / knowledge into details / parts and indicate their relationships as a whole by actions such as analysis, classification, comparison, synthesis, ... |
| 4.0 < Level ≤ 5.0 | Assessment: Students make judgments, predictions about knowledge / information according to standards, criteria and measurement indicators which have been determined by actions such as comments, criticisms, recommendations, .. . |
| 5.0 < Level ≤ 6.0 | Excellent | Creation: Students create / organize / organize / design / generalize parts / parts in other / new ways to create new structures / models / products. |

**5. Total program credits:** 141 credits

(not including physical and national defense education)

**6. Allocation of Knowledge Group**

|  |  |  |  |
| --- | --- | --- | --- |
| **Name of Knowledge Group** | **Credits** | | |
| **Total** | **Compulsion** | **Option** |
| **General Knowledge** | **59** | **49** | **10** |
| General Politics + Laws | 13 | 13 |  |
| Social Sciences and Humanities | 4 |  | 4 |
| English | 9 | 9 |  |
| Mathematics and Natural Sciences | 28 | 22 | 6 |
| Technical Computer Sciences | 2 | 2 |  |
| Introduction to Automotive Engineering Technology | 3 | 3 |  |
| **Professional knowledge** | **82** | **68** | **14** |
| Foundation of Major | 23 | 21 | 2 |
| Professional Major | 27 | 22 | 5 |
| Interdisciplinary | 5 |  | 5 |
| Interprise Seminar (AET) | 2 | 2 |  |
| Practices | 17 | 15 | 2 |
| Intership (AET) | 2 | 2 |  |
| Capstone project (AET) | 6 | 6 |  |
| **Physical and National Defense Education; English** | Non-  accumulation |  |  |
| Physical ducation 1 | 1 |  |  |
| Physical ducation 2 | 1 |  |  |
| Physical ducation 3 (Option) | 3 |  |  |
| National Defense Education | 165 hrs |  |  |
| English | 6 |  |  |
| **Extracurricular** | Non-  accumulation |  |  |
| Leadership and business in engineering | 2 |  |  |

**7. Content of Program**

**A – Composory Courses**

***7.1. General Knowledge***

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **No.** | **Course code** | **Course name** | **Credits** | **Prerequisite** |
|  | LLCT130105E | Philosophy of Marxism and Leninism | 3 |  |
|  | LLCT120205E | Political economics of Marxism and Leninism | 2 |  |
|  | LLCT120405E | Scientific socialism | 2 |  |
|  | LLCT220514E | History of Vietnamese communist party | 2 |  |
|  | LLCT120314E | Ho Chi Minh’s ideology | 2 |  |
|  | GELA220405E | General Law | 2 |  |
|  | MATH132401E | Calculus 1 | 3 |  |
|  | MATH132501E | Calculus 2 | 3 |  |
|  | MATH132601E | Calculus 3 | 3 |  |
|  | MATH132901E | Mathematical Statistics for Engineers | 3 |  |
|  | PHYS130902E | Physics 1 | 3 |  |
|  | PHYS131002E | Physics 2 | 3 |  |
|  | PHYS111202E | Physics - Laboratory 1 | 1 |  |
|  | GCHE130603E | Chemistry for Engineers | 3 |  |
|  | CCPR224064E | C Programming | 2 (1+1) |  |
|  | INAT130130E | Introduction to Automotive Technology | 3 (2+1) |  |
|  | EHQT 130137E | Academic English 1 | 3 |  |
|  | EHQT 230237E | Academic English 2 | 3 |  |
|  | EHQT 230337E | Academic English 3 | 3 |  |
|  | TEEN127131E | Technical English 1 | 2 |  |
|  | TEEN237231E | Technical English 2 | 3 |  |
|  | PHED110513E | Physical Education 1 | 1 |  |
|  | PHED110613E | Physical Education 2 | 1 |  |
|  | PHED130715E | Physical Education 3 | 3 |  |
|  | - | National Defense Education | 165 hrs |  |
| **Total** | | | **49** |  |

***7.2. Professional knowledge***

**7.2.1. Foundation of major**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **No.** | **Course code** | **Course name** | **Credits** | **Prerequisite** |
|  | THME230721E | Theoretical Mechanics | 3 |  |
|  | STMA230521E | Strength of Materials | 3 | THME230721E |
|  | ENDR130123E | Engineering Drawing 1 | 3 |  |
|  | TOMT220225E | Measuring Techniques & Tolerances | 2 |  |
|  | AEEE230833E | Electrical and Electronic Engineering | 3 |  |
|  | THER222932E | Thermal Engineering | 2 |  |
|  | MEMD230323E | Principles and Parts of Machines | 3 |  |
|  | AMIC320133E | Application of Microcontroller | 2 |  |
| **Total** | | | **21** |  |

**7.2.2.a Professional Major Courses (Theory and Practice courses)**

**– Compulsory subjects**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **No.** | **Course code** | **Course name** | **Credits** | **Prerequisite** |
|  | ICEP330330E | Internal Combustion Engine Principles | 3 |  |
|  | THEV330131E | Theory of Vehicles | 3 | THEV330131E |
|  | ICEC320430E | Internal Combustion Engine Calculation | 2 |  |
|  | VEDE320231E | Vehicle Design | 2 |  |
|  | AEVE320830E | Alternative Energies for Vehicles | 2 |  |
|  | AEES330233E | Automotive Electrical and Electronic Systems | 3 |  |
|  | VACS330333E | Vehicle Automatic Control Systems | 3 |  |
|  | EFAE327031E | English for Automotive Engineering | 2 |  |
|  | ASMA220230E | Automotive Service Management | 2 |  |
| **Total** | | | **22** |  |

**7.2.2.b Major Practices**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **No.** | **Course code** | **Course name** | **Credits** | **Prerequisite** |
|  | PICE321030E | Practice of Internal Combustion Engine | 2 |  |
|  | PEMS331130E | Practice of Engine Management | 3 |  |
|  | PAES321133E | Practice of Automotive Electrical Systems | 2 |  |
|  | PABE331233E | Practice of Automotive Body Electrical systems | 3 |  |
|  | PAPS331131E | Practice of Automotive Powertrains System | 3 |  |
|  | PACS321231E | Practice of Automotive Chassis System | 2 |  |
| **Total** | | | **15** |  |

**7.2.3. Internship and Capstone project**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **No.** | **Course code** | **Course name** | **Credits** | **Prerequisite** |
|  | PRGR422130E | Practice of Graduation (AET) | 2 |  |
|  | GRTH462030E | Graduation Thesis | 7 |  |
| **Total** | | | **9** |  |

***The requirement for Graduation:* Pass the “Qualified exam”**

**B – Optional Subjects**

**Knowledge of Social Sciences and Humanities**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **No.** | **Course code** | **Course name** | **Credits** | **Prerequisite** |
|  | GEEC220105E | General Economics | 2 | GEEC220105E |
|  | IQMA220205E | Introduction to Quality Management | 2 |  |
|  | INMA220305E | Introduction of Management | 2 |  |
|  | INLO220405E | Introduction to Logic | 2 |  |
|  | ENPS220591E | Engineering Psychology | 2 |  |
|  | SYTH220491E | System Thinking | 2 |  |
|  | PLSK120290 | Planing Skills | 2 |  |
|  | WOPS120390E | Workplace Skills | 2 |  |
|  | REME320690E | Research Mothod | 2 |  |

**Mathematics and Natural Sciences: 6crs**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **No.** | **Course code** | **Course name** | **Credits** | **Prerequisite** |
|  | MATH133101E | Higher Mathematics for Engineers 1 | 3 | Choose 2 |
|  | MATH133201E | Higher Mathematics for Engineers 2 | 3 |
|  | PHYS131102 | Principles of Physics 3 | 3 |

**Foundation of major: 2crs**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **No.** | **Course code** | **Course name** | **Credits** | **Prerequisite** |
|  | FMMT320825E | Fundamentals of Machine Manufacturing Technology | 2 | Choose 1 |
|  | PHEQ220332E | Hydraulic Machines | 2 |
|  | METE320126E | Metal Technology | 2 |
|  | FLUI220132E | Fluid Mechanics (FME) | 2 |

**Professional Major: 5 Crs**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **No.** | **Course code** | **Course name** | **Credits** | **Prerequisite** |
|  | CAES320530E | Application of computer (EN) | 2 (1+1) | Choose 1 |
|  | CADS320531E | Application of computer (CH) | 2 (1+1) |
|  | CAMC320533E | Application of computer (EL) | 2 (1+1) |
|  | SPAE310730E | Special Project (EN) | 1 | Choose 1 |
|  | SPAC312131E | Special Project (CH) | 1 |
|  | SPAE310733E | Special Project (EL) | 1 |
|  | AAMT320830E | Automotive Assembly and Manufacturing Technology | 2 | Choose 1 |
|  | ADRT320331E | Automotive Diagnosic and Repair Techiques | 2 |
|  | AVIN320431E | Automotive Vibration and Noise | 2 |

**Practice Courses: 2 Crs**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **No.** | **Course code** | **Course name** | **Credits** | **Prerequisite** |
|  | POAD321230E | Practice of Automotive Diagnostics | 2 | Choose 1 |
|  | PABP321331E | Practice of Automotive Body and Paint | 2 |
|  | PAUP321333E | Practice of Automotive Programming | 2 |

**C – Interdisciplinary: 5 Crs**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **No.** | **Course code** | **Course name** | **Credits** | **Prerequisite** |
|  | IMAS320525E | Maintenance in Industry | 2 | Choose 1 |
|  | AUMP323525E | Automation of Manufacturing Process | 2 |
|  | ERMA326032E | Energy Source and Energy Management | 2 |
|  | MEVI220820E | Mechanical Vibrations | 2 |
|  | PNHY230529E | Pneumatic & Hydraulic Technology | 3 | Choose 1 |
|  | MQMA331326E | Managing production and quality | 3 |
|  | DEIP331225E | Designing of industrial products | 3 (2+1) |
|  | AUCO330329E | Automatic Control | 3 |

**8. Training plan**

**1st Semester:**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **No.** | **Course code** | **Course name** | **Credits** | **Prerequisite** |
|  | LLCT130105E | Philosophy of Marxism and Leninism | 3 |  |
|  | LLCT120205E | Political economics of Marxism and Leninism | 2 |  |
|  | GELA220405E | General Law | 2 |  |
|  | INAT130130E | Introduction to Automotive Technology | 3 (2+1) |  |
|  | PHYS130902E | Physics 1 | 3 |  |
|  | MATH132401E | Calculus 1 | 3 |  |
|  | GCHE130603E | Chemistry for Engineering Students | 3 |  |
|  | PHED110513E | Physical Education 1 | 1 | Non-  accumulation |
|  |  | Academic English 1 | 3 |  |
| **Total** | | | **22** |  |

**2nd Semester:**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **No.** | **Course code** | **Course name** | **Credits** | **Prerequisite** |
|  | LLCT120405E | Scientific socialism | 2 |  |
|  | LLCT120314E | Ho Chi Minh’s ideology | 2 |  |
|  | MATH132501E | Calculus 1 | 3 |  |
|  | PHYS131002E | Physics 2 | 3 |  |
|  | PHYS111202E | Physics - Laboratory 1 | 1 |  |
|  | MATH132901E | Mathematical Statistics for Engineers | 3 |  |
|  | ENDR130123E | Engineering Drawing 1 | 3 |  |
|  | THME230721E | Theoretical Mechanics | 3 |  |
|  | PHED110613E | Physical Education 2 | 1 | Non-  accumulation |
|  |  | National Defense Education | 4 | Non-  accumulation |
|  |  | Academic English 2 | 3 |  |
| **Total** | | | **23** |  |

**3rd Semester:**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **No.** | **Course code** | **Course name** | **Credits** | **Prerequisite** |
|  | LLCT220514E | History of Vietnamese communist party | 2 |  |
|  | CCPR224064 | C Programming | 2 (1+1) |  |
|  | THER222932E | Thermal Engineering | 2 |  |
|  |  | Social Sciences and Humanities (1) (option) | 2 |  |
|  | MATH132601E | Calculus 3 | 3 |  |
|  | MEMD230323E | Principles and Parts of Machines | 3 |  |
|  | STMA230521E | Strength of Materials | 3 | THME230721 |
|  | PHED130715E | Physical Education 3 | 1 | Non-  accumulation |
|  |  | Academic English 3 | 3 |  |
| **Total** | | | **20** |  |

**4th Semester:**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **No.** | **Course code** | **Course name** | **Credits** | **Prerequisite** |
|  |  | Mathematics and Natural Sciences (1) (option) | 3 |  |
|  | ICEP330330E | Internal Combustion Engine Principles | 3 |  |
|  | THEV330131E | Theory of Vehicles | 3 |  |
|  | AEEE230833E | Electrical and Electronic Engineering | 3 |  |
|  |  | Social Sciences and Humanities (2) (option)) | 2 |  |
|  | TOMT220225E | Measuring Techniques & Tolerances | 2 |  |
|  | FMMT320825E | Fundamentals of Machine Manufacturing Technology | 2 | Choose 1 |
|  | PHEQ220332E | Hydraulic Machines | 2 |
|  | METE320126E | Metal Technology | 2 |
|  | FLUI220132E | Fluid Mechanics (FME) | 2 |
|  |  | Technical English 1 | 3 | Non-  accumulation |
| **Total** | | | **18** |  |

**5th Semester:**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **No.** | **Course code** | **Course name** | **Credits** | **Prerequisite** |
|  |  | Mathematics and Natural Sciences (2) (option) | 3 |  |
|  | AMIC320133E | Application of Microcontroller | 2 |  |
|  | VEDE320231E | Vehicle Design | 2 | THEV330131E |
|  | AEES330233E | Automotive Electrical and Electronic Systems | 3 |  |
|  | ICEC320430E | Internal Combustion Engine Calculation | 2 (1+1) | ICEP330330 |
|  | PICE321030E | Practice of Internal Combustion Engine | 2 | ICEP330330 |
|  | PAPS331131E | Practice of Automotive Powertrains System | 3 |  |
|  |  | Technical English 2 | 3 | Non-acciculate |
| **Total** | | | **17** |  |

**6th Semester:**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **No.** | **Course code** | **Course name** | | **Credits** | **Prerequisite** |
|  | VACS330333E | Vehicle Automatic Control Systems | | 3 |  |
|  | CAES320530E | Application of computer (EN) | | 2 (1+1) | Chọn 1 |
|  | CADS320531E | Application of computer (CH) | | 2 (1+1) |
|  | CAMC320533E | Application of computer (EL) | | 2 (1+1) |
|  | PEMS331130E | Practice of Engine Management | | 3 |  |
|  | PACS321231E | Practice of Automotive Chassis System | | 2 |  |
|  | PAES321133E | Practice of Automotive Electrical Systems | | 2 | AEES330233E |
|  | AEVE320830E | Alternative Energies for Vehicles | | 2 |  |
|  |  | Interdisciplinary 1 (option 1) | | 2 |  |
|  | SPAE310730E | Special Project (EN) | Choose 1 | 1 | ICEC320430 |
|  | SPAC312131E | Special Project (CH) | 1 | VEDE320231 |
|  | SPAE310733 | Special Project (EL) | 1 | AACS330333 |
| **Total** | | | | **17** |  |

**7th Semester:**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **No.** | **Course code** | **Course name** | **Credits** | **Prerequisite** |
|  | INSE320931E | Interprise Seminar (AET) | 2 |  |
|  | EFAE327031E | English for Automotive Engineering | 2 |  |
|  | AAMT320830E | Automotive Assembly and Manufacturing Technology | 2 | Choose 1 |
|  | ADRT320331E | Automotive Diagnosic and Repair Techiques | 2 |
|  | AVIN320431E | Automotive Vibration and Noise | 2 |
|  | PABE331233E | Practice of Automotive Body Electrical systems | 3 |  |
|  | POAD321230E | Practice of Automotive Diagnostics | 2 | Choose 1 |
|  | PABP321331E | Practice of Automotive Body and Paint | 2 |
|  | PAUP321333E | Practice of Automotive Programming | 2 |
|  |  | Interdisciplinary 2 (option 2) | 3 | Choose 1 |
|  | ASMA220230E | Automotive Service Management | 2 |  |
| **Total** | | | **16** |  |

**8th Semester:**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **No.** | **Course code** | **Course name** | **Credits** | **Prerequisite** |
|  | PRGR422130E | Practice of Graduation (AET) | 2 |  |
|  | GRTH462030E | Graduation Thesis | 6 |  |
| **Total** | | | **8** |  |

**9. COURSE DESCRIPTION AND CREDITS**

**9.1 FOUNDATION SCIENCE COURSES**

**1. <Calculus I> <3>**

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

**2. <Calculus II> <3>**

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

**3. <Calculus III> <3>**

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

**4. <Mathematical Statistics for Engineers> <3>**

* *Distribution of learning time: 3 (3/0/6)*
* *Former subjects of condition: None*
* *Course Description*: This course provides the learner with contents: multiple integral: This module inc descriptive statistics, elementary probabilities, random variables and probability distribution laws, characteristic numbers of random variables, parameter estimates, hypothesis testing, correlation and linear regression.

**5. <Higher Mathematics for Engineers 1> <3>**

* *Distribution of learning time: 3 (3/0/6)*
* *Former subjects of condition: None*
* *Course Description*: This module provides basic knowledge of first-degree differential equations; Model with a first degree differential equation; high-level differential equation; Model with high-level differential equations; Laplace transforms; Root solution of linear differential equations.

**6. <Higher Mathematics for Engineers 2> <3>**

* *Distribution of learning time: 3 (3/0/6)*
* *Former subjects of condition: None*
* Course *Description*: This module provides basic knowledge of linear algebra, systems of differential equations, Fourier series and solutions of boundary problems for partial derivative equations.

**7. <Physics 1> <3>**

* *Distribution of learning time: 3(2/1/4)*
* *Former subjects of condition: None*
* *Summaries of course:* This course provides the learner with 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.

**8. < Physics 2> <3>**

* *Distribution of learning time: 3(2/1/4)*
* *Former subjects of condition:* **Physics 1**
* *Summaries of course:* This course provides the learner with includes electromagnetism and optics, as a basis for access to university-level majors in science, engineering and technology. Students will be equipped with the knowledge of phenomena in the natural world and apply that knowledge in scientific research, in technical and technological development.

**9. < Physics 3> <3>**

* *Distribution of learning time: 3(2/1/4)*
* *Former subjects of condition:* **Physics 2**
* *Summaries of course:* This module provides students with the basic content of modern physics, including the parts of relativity, quantum mechanics, atomic physics, molecules and solids, nuclear structures, and Particle physics. The physical module 3 provides the basis for access to university-level majors in science, engineering and technology. Students will be equipped with the knowledge of phenomena in the natural world and apply that knowledge in scientific research, in technical development and modern technology..

**10. <Physics - Laboratory 1> <1>**

* *Distribution of learning time: 1(1/0/2)*
* *Former subjects of condition:* **Physics 1, Physics 2**
* *Summaries of course:* This module consists of a unit with 9 experiments on dynamics, point dynamics and solid dynamics. This is an additional course for students of the college and university technology department of the knowledge of the nature of physical phenomena occurring in nature, re-examining the theoretical physics learned in the chapter. The course is designed to train future engineers to observe, conduct experiments, measure and calculate, analyze and process data.

**11. <Chemistry for Engineers> <3>**

* *Distribution of learning time: 3(2/1/4)*
* *Former subjects of condition: None*
* *Summaries of course:* 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.

**12. <C Programming> <2>**

* *Distribution of learning time: 2(1/1/4)*
* *Former subjects of condition: None*
* *Summaries of course:* This course provides general knowledge for engineering about programming. Help students get familiar with programming languages, programming background, programming syntax, ... After completing this module, learners After completing this module, learners are able to apply Using the knowledge learned to solve some problems from basic to advanced in technology.

**13. <Introduction of Automotive Engineering Technology> <3>**

* *Distribution of learning time: 3(2/1/6)*
* *Former subjects of condition: None*
* *Summaries of course:* This course provides general knowledge for engineering about Introduction to Automotive Engineering 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 in Automotive Engineering Tecchnology at the University of Technical Education HCMC. This course equips students with career orientations, and soft skills as well as professional ethics.

**14. <Academic English 1> <3>**

* *Distribution of learning time: 3(3/0/6)*
* *Former subjects of condition: None*
* *Summaries of course:* The course aims at:

- Building up students’ confidence in using Reading and Writing skills, with a strong focus on communication functions through acquiring new language knowledge besides revising and recycling the language learnt in the previous levels;

- Enhancing students’ use of a wide range of language inputs to produce appropriate, natural language and communication outputs in academic contexts and situations, besides those of personal and social life;

- Improving students’ fluency in language use, especially in writing and reading for academic purposes; Bridging students to effective learning skills e.g. discussion, research, seminar, presentation.

**15. <Academic English 2> <3>**

* *Distribution of learning time: 3(3/0/6)*
* *Former subjects of condition:* **Academic English 1**
* *Summaries of course:* The course aims at:

- Building up students’ confidence in using Listening &Speaking skills, with a strong focus on communication functions through acquiring new language knowledge besides revising and recycling the language learnt in the previous levels;

- Enhancing students’ use of a wide range of language inputs to produce appropriate, natural language and communication outputs in academic contexts and situations, besides those of personal and social life;

- Improving students’ fluency in language use in Speaking for academic purposes;

- Bridging students to effective learning skills e.g. discussion, research, seminar, presentation. Effectively and actively work individually, in pairs and groups.

**16. < Academic English 3> <3>**

* *Distribution of learning time: 3(3/0/6)*
* *Former subjects of condition:* **Academic English 2**
* *Summaries of course:* The course aims at:

- Strengthening students’ confidence in using four language skills (Listening, Speaking, Reading and Writing), with a strong focus on communication functions through acquiring new language knowledge besides revising and recycling the language learnt in the previous levels;

- Enhancing students’ use of a wide range of language inputs to produce appropriate, natural language and communication outputs in academic contexts and situations, besides those of personal and social life;

- Improving students’ fluency in language use, especially in writing and reading for academic purposes; Improving students to effective learning skills including critical thinking, discussion, research, seminar, presentation. Getting students familiar with the format of the IELTS exam.

**17. < Technical English 1> <3>**

* *Distribution of learning time: 3(3/0/6)*
* *Former subjects of condition:* **Academic English 3**
* *Summaries of course:* The course aims at:

- Strengthening students’ confidence in using four language skills (Listening, Speaking, Reading and Writing), with a strong focus on communication functions through acquiring new language knowledge besides revising and recycling the language learnt in the previous levels;

- Enhancing students’ use of a wide range of language inputs to produce appropriate, natural language and communication outputs in academic contexts and situations, besides those of personal and social life;

- Improving students’ fluency in language use, especially in writing and reading for academic purposes; Improving students to effective learning skills including critical thinking, discussion, research, seminar, presentation.

- Reinforcing students’ skills in doing IELTS. Getting students familiar with IELTS exams (Academic Module)

**18. < Technical English 2> <3>**

* *Distribution of learning time: 3(3/0/6)*
* *Former subjects of condition:* **Technical English 2**
* *Summaries of course:* The course aims at:

- Thoroughly strengthening students’ confidence in using four language skills (Listening, Speaking, Reading and Writing), with a strong focus on communication functions through acquiring new language knowledge besides revising and recycling the language learnt in the previous levels;

- Enhancing students’ use of a wide range of language inputs to produce appropriate, natural language and communication outputs in academic contexts and situations, besides those of personal and social life; Improving students’ fluency in language use, especially in writing and reading for academic purposes;

- Improving students to effective learning skills including critical thinking, discussion, research, seminar, presentation. Continuing to reinforce students’ skills in doing IELTS tests (Academic Module). Getting students quite familiar with IELTS exams (Academic Module)

**9.2 KIẾN THỨC CƠ SỞ NGÀNH**

1. **<Theoretical Mechanics> <3>**

* *Distribution of learning time: 3(3/0/6)*
* *Former subjects of condition:* None
* *Summaries of course:* 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.

1. **<Strength of Materials> <3>**

* *Distribution of learning time: 3(3/0/6)*
* *Former subjects of condition:* None
* *Summaries of course:* 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.

1. **<Engineering Drawing 1> <3>**

* *Distribution of learning time: 3(3/0/6)*
* *Former subjects of condition:* 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.

1. **<Measuring Techniques & Tolerances> <2>**

* *Distribution of learning time: 2(2/0/4)*
* *Former subjects of condition:* None
* *Course description:* This course provides students tolerance and assembly of common joints in machine manufacturing industry such as smooth cylindrical joints, key joints and then flower joints, threaded joints, methods of solving size sequence problems and basic principles for recording dimensions above detailed drawings, some types of measuring instruments and methods of measuring the basic parameters of the parts.

1. **<Kỹ thuật điện-điện tử> <3>**

* *Distribution of learning time: 3(3/0/6)*
* *Former subjects of condition:* None
* *Course description:* This course provides students for students who are not majoring in electricity, to provide basic knowledge about electrical machines, electrical circuits, how to calculate circuits, structural principles, features and applications of basic electrical machines; Provides an overview of measurement of electrical quantities. On that basis, it is possible to understand the electric machines, electric appliances often encountered in production and life.

1. **<Thermal Engineering> <2>**

* *Distribution of learning time: 2(2/0/4)*
* *Former subjects of condition:* None
* *Course description:* This course provides students with some basic concepts of technical thermodynamics, the laws of 1 and 2, the cycles of labor and consumption, thereby calculating the heat and labor for the cycles. The heat transfer section helps students grasp some related concepts as well as the laws of heat exchange: heat conduction, convection heat transfer, heat radiation..

1. **<Principles and Parts of Machines> <3>**

* *Distribution of learning time: 3(3/0/6)*
* *Former subjects of condition:* None
* *Course description:* This course provides students the structure, working principle and calculation method of kinematic design and dynamics of transmission mechanism and motion change, joints and machine components commonly used in mechanics. After studying, students have the ability to independently solve the problems of calculation and design of machine parts, which serve as a basis for application in the process of calculating the design and machine details in the following technical practice.

1. **<Application of Microcontroller> <2>**

* *Distribution of learning time: 2(2/0/4)*
* *Former subjects of condition:* None
* *Course description:* The course includes knowledge about the hardware structure of the microcontroller (internal memories, timers, special functions to be used as interrupts), how to program the microcontroller and its scripts for practical application. After completing this course, student could be:
* Understand the structure of a control processing system.
* Apply Microcontroller for designing circuit.
* Programming the Microcontroller to handle and control peripherals.

1. **<Fundamentals of Machine Manufacturing Technology> <3>**

* *Distribution of learning time: 3(3/0/6)*
* *Former subjects of condition:* None
* *Course description:* The module provides the theoretical basis of metal cutting, the theoretical basis of machining methods. Processing accuracy and surface quality of workpieces, influencing factors and remedial directions. Select the standard and set when processing. Features cutting and machining processes on universal, specialized machines, etc.

1. **<Metal Technology> <3>**

* *Distribution of learning time: 3(3/0/6)*
* *Former subjects of condition:* None
* *Course description:* The module aims to provide students with basic knowledge of technology and equipment for metal processing by casting, pressure and welding, metal cutting, and embryo methods. for cutting.

1. **<Hydraulic Machines> <2>**

* *Distribution of learning time: 2(2/0/4)*
* *Former subjects of condition:* Fluid Mechanics
* *Course description:* This module equips learners with basic knowledge about hydraulic and pneumatic machines, their structure, operating principles, characteristics, scope of use, common failures, methods of repair and maintenance. , maintenance of hydraulic and pneumatic machines such as vane pumps, volumetric pumps, centrifugal fans, axial fans, air compressors. At the same time, the module also gives learners the ability to design, construct and install a complete pneumatic hydraulic system. Learners have the ability to safely operate all types of hydraulic machines and hydraulic systems.

1. **<Fluid Mechanics> <2>**

* *Distribution of learning time: 2(2/0/4)*
* *Former subjects of condition:* Theoretical Mechanics, Strength of Materials
* *Course description:* This module equips learners with basic knowledge about properties of fluid. Studying the equilibrium law of static fluid, calculating hydrostatic pressure, studying the laws of fluid flow and its characteristic parameters without regard to the force, studying the force acting in the environment fluid flow and laws of force interaction between fluid flow and solid objects. Learn about the unidirectional fluid motion that flows through a nozzle hole The module also provides learners with knowledge and skills in calculating, designing, analyzing, evaluating and consulting the advantages and disadvantages of hydraulic systems for constructions.

1. **<General Economics> <2>**

* *Distribution of learning time: 2(2/0/4)*
* *Former subjects of condition:* None
* *Course description:* This module provides non-major students with basic knowledge of economics, real phenomena that are happening in the economy from the micro and macro perspective.

1. **<Introduction to Quality Management> <2>**

* *Distribution of learning time: 2(2/0/4)*
* *Former subjects of condition:* None
* *Course description:* This module provides learners with basic knowledge of governance, including the basic functions of management activities, the impact of the most general environmental factors on the business activities of a company. business, the most basic guidelines on business cost management, recruitment and management of human resources, strategic management, and risk management to help managers identify and provide solutions to deal promptly.

1. **<Introduction of Management> <2>**

* *Distribution of learning time: 2(2/0/4)*
* *Former subjects of condition:* None
* *Course description*: This module provides learners with basic knowledge of governance, including the most general environmental factors affecting the business and the basic functions of governance in business organizations, including: planning, organizing, leading, and testing. Besides, class activities are; designed to improve information searching skills, public speaking, thinking; student review

1. **< Introduction to Logic > <2>**

* *Distribution of learning time: 2(2/0/4)*
* *Former subjects of condition:* None
* *Course description:* This module provides learners with knowledge of the cognitive processes of human cognition and the nature of thinking activity. Learners are provided with knowledge of the basic rules of thinking and forms of thinking through which to train logical thinking, be able to use words and sentences correctly in expressing thought, and have skill in making up comment, interpret as well as prove, reject the problem of persuasion, think critically, consistently, overcome errors in thinking, in communication.

1. **<Engineering Psychology> <2>**

* *Distribution of learning time: 2(2/0/4)*
* *Former subjects of condition:* None
* *Course description:* This module provides learners with the basic knowledge of creativity and entrepreneurship, the stages to go through in incubating ideas and developing them into successful businesses. In addition, the attributes of an entrepreneur and the skills required of a leader, business management will also be equipped through further reading, case studies, class discussions and final projects. . Learners can better identify and proactively select business opportunities; will develop skills and confidence to plan and start a business.

1. **<Engineering Psychology> <2>**

* *Distribution of learning time: 2(2/0/4)*
* *Former subjects of condition:* None
* *Course description:* In order to create the interaction between technology and people, students of technology majors need to understand the basic psychological characteristics of humans. The Engineering Psychology module will provide technical technology students with the knowledge of human psychology and the application of this knowledge into the design of engineering systems that are suitable for humans.

1. **<System Thinking> <2>**

* *Distribution of learning time: 2(2/0/4)*
* *Former subjects of condition:* None
* *Course description:* The System Thinking module provides students with basic knowledge about systems, systematic methodologies, and creative thinking methods; forming in students the ability to reason and solve problems systematically, logically and creatively.

1. **< Planing Skills > <2>**

* *Distribution of learning time: 2(2/0/4)*
* *Former subjects of condition:* None
* *Course description:* This module provides learners with basic knowledge about planning method. Instructing learners in thinking skills and finding solutions suitable to their own conditions and circumstances from which learners develop their study skills, short-term personal plans and long-term, plan for the right job and be effective. In addition, instructors learn how and time management skills and work arrangements effectively.

1. **<Workplace Skills> <2>**

* *Distribution of learning time: 2(2/0/4)*
* *Former subjects of condition:* None
* *Course description:* This subjects belong to a group of elective subjects in the field of technology and technology. This course aims to provide students with some basic working skills in a technical environment, especially those working in a multicultural, modern environment with rapid technological change..

1. **<Research Mothod> <2>**

* *Distribution of learning time: 2(3/0/4)*
* *Former subjects of condition:* None
* *Course description:* The Methodology of Scientific Research module covers the content of concepts, processes and structures ... From which students guide the selection of research topics, prepare an outline and apply it. research methods while collecting and processing reasonable information while conducting scientific research. Students will be active in signing up for research projects at the school level as well as conduct graduate thesis or graduation project scientifically and successfully.

**9.3 SPECIALIZED COURSES**

1. **<Internal Combustion Engine Principles> <3>**

* *Distribution of learning time: 3(3/0/6)*
* *Former subjects of condition:* None
* *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.

1. **<Theory of Vehicles> <3>**

* *Distribution of learning time: 3(3/0/6)*
* *Former subjects of condition:* None
* *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.

1. **<Internal Combustion Engine Calculations> <2>**

* *Distribution of learning time: 2(2/1/4)*
* *Former subjects of condition:* Internal Combustion Engine Principles
* Coursedescription*:* 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.

1. **<Vehicle Design> <2>**

* *Distribution of learning time: 2(2/0/4)*
* *Former subjects of condition:* Theory of Vehicles
* *Course* description*:* This course provides students with the knowledge for assessing the quality of automobile dynamics, for applications in operation and exploitation as well as in calculating dynamics and dynamics for cars.

1. **<Alternative Energies for Vehicles> <2>**

* *Distribution of learning time: 2(3/0/6)*
* *Former subjects of condition:* Internal Combustion Engine Principles
* *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.

1. **<Automotive Electrical and Electronic Systems> <3>**

* *Distribution of learning time: 3(3/0/6)*
* *Former subjects of condition:* None
* *Course description:* This course provides students with automotive engineering technology basic knowledge about the electrical - electronic systems of automotive engines and bodywork systems. Diagram, structure, working principle, characteristics, circuit diagram and calculation of separate systems constituting the engine electric network and vehicle body electrical system, including: starter battery, starter system, load, ignition, programmable control system for engine, anti-theft system, lighting and signaling system, information system, auxiliary power system.

1. **<Vehicle Automatic Control Systems> <3>**

* *Distribution of learning time: 3(3/0/6)*
* *Former subjects of condition:* None
* *Course description:* This course provides students in automotive engineering with basic knowledge about automotive automatic control systems, including: diagram, structure, working principle, characteristics, circuit diagram. and calculating the separate systems that comprise the electrical network of automated control systems. Specifically: automatic transmission control system, ABS system, airbag system, CCS system.

1. **<English for Automotive Engineering> <2>**

* *Distribution of learning time: 2(3/0/6)*
* *Former subjects of condition:* None
* *Course description:* This course provides students with a number of specialized terms and procedures for performing professional tasks so that students can read and refer to textbooks and magazines specialized in automotive engineering technology; improve reading comprehension skills, presentation and writing of technical product descriptions, reports, ... in English and improve communication skills in English to help students be confident when working in foreign environment.

1. **<Automobile Service Management> <2>**

* *Distribution of learning time: 2(3/0/6)*
* *Former subjects of condition:* None
* *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.

1. **<Practice of Internal Combustion Engine> <3>**

* *Distribution of learning time: 3(0/3/6)*
* *Former subjects of condition:* Internal Combustion Engine Principles
* *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.

1. **<Practice of Engine Management System> <3>**

* *Distribution of learning time: 3(0/3/6)*
* *Former subjects of condition:* Internal Combustion Engine Principles
* *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.

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1. **< Practice of Automotive Electrical Systems> <2>**

* *Distribution of learning time: 2(0/2/4)*
* *Former subjects of condition:* Electrical and Electronic Engineering, Automotive Electrical and Electronic Systems
* *Course description:* This module provides knowledge about the structure and working principles of automotive electric motor systems. Methods of disassembling, inspecting, repairing, determining the causes of damage, methods of diagnosing and finding panels belonging to the motor electrical system include: Power supply system, Starting system, engine control system, coding system, anti-theft system.

1. **<Practice of Automotive Powertrains System> <3>**

* *Distribution of learning time: 3(0/3/6)*
* *Former subjects of condition:* Theory of Vehicles
* *Course description:* This module provides students with automotive engineering technology basic knowledge about automotive powertrain systems include: clutch-gearbox, automatic transmission, transmission shafts Posted, active bridge, active multi-bridge vehicle (4WD). System structure, general structure, structure detailed cluster, working principle of each system and cluster. Method of disassembling, assembling, inspecting these assemblies when disassembled from the vehicle, the method of checking the assemblies or the system when it is assembled on vehicle.

1. **<Practice of Automotive Chassis System> <2>**

* *Distribution of learning time: 2(0/2/4)*
* *Former subjects of condition:* Practice of Automotive Powertrains System
* *Course description*: This module provides students with automotive engineering technology basic knowledge, about structure, system working principle, skill of disassembling, assembling detailed assemblies and methods check the system assembly when it is still in the vehicle or when it is disassembled control system and automobile motion. This system includes: suspension, steering, angle put the wheels, brakes.

1. **<Application of computer (EN)> <2>**

* *Distribution of learning time: 2(1/1/2)*
* *Former subjects of condition:* None
* *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 help learners capable of using designing tools and simulations in automotive engineering technology.

1. **<Application of computer (CH)> <2>**

* *Distribution of learning time: 2(1/1/2)*
* *Former subjects of condition:* None
* *Course description*: This module helps students synthesize, systematize knowledge, develop methods for modeling, simulation and applicability of computer software to solve technical problems related to dynamics, control and automotive design.

1. **<Application of computer (EL)> <2>**

* *Distribution of learning time: 2(1/1/2)*
* *Former subjects of condition:* None
* *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; students know how to measure the signal from the sensors and know how to compute and convert the measurement data and control quantities

1. **< Special Project (EN)> <1>**

* *Distribution of learning time: 1(0/1/2)*
* *Former subjects of condition:* Internal Combustion Engine Principles, Internal Combustion Engine Calculation.
* *Course* *description*: The subject project is the part of strengthening, synthesizing and applying the knowledge to thermodynamic cycle calculation of internal combustion engine, kinetics and dynamics of structure and calculation structure some basic details on internal combustion engine. Besides, the subject is also equipped Show students some software applications (Matlab) to calculate heat and kinetic dynamics internal combustion engine evaluates a number of important kinetic and kinematic properties of the structure Graphs of dynamics and dynamics of generating structure.

1. **<Special Project (CH)> <1>**

* *Distribution of learning time: 1(0/1/2)*
* *Former subjects of condition:* Theory of Vehicles, Vehicle Design
* *Course* *description*: This module helps students synthesize, systematize knowledge, develop private ability only, skills needed to independently and creatively solve academic problems  
  or specifically in practice relating to automotive theory and automotive calculations. Through this module, students have the ability to: Applying the knowledge learned in the subjects of "Theory of Vehicles" and "Vehicle Design" overall calculation of a car cluster or system, evaluating some operational features of the automotive system, the working criteria of the automobile.

1. **<Special Project (EL)> <1>**

* *Distribution of learning time: 1(0/1/2)*
* *Former subjects of condition: None*
* *Course* description: This module helps students synthesize and apply the knowledge learned to calculate some basic details on the automotive electrical and electronic system. In addition, the course also equips students with application of softwares to calculate and program some important automotive systems.

1. **<Automotive Assembly and Manufacturing Technology> <2>**

* *Distribution of learning time: 2(2/0/4)*
* *Former subjects of condition: None*
* *Course* *description*: This module helps students with basic knowledge about automobilemanufacturing and assembly technology, organizational forms, content design, technological processes in automobile assembly and repair. ; standards, procedures for technical safety and environmental protection inspection of automobiles. This module helps learners build their organizational, production and professional competence in automobile assembly and assembly.

1. **<Automotive Diagnosic and Repair Techiques> <2>**

* *Distribution of learning time: 2(2/0/4)*
* *Former subjects of condition: None*
* *Course* *description*: This module helps students with basic knowledge about automotive diagnostic and repair technologies. Refers to the contents related to the diagnostic process in auto repair; standards, procedures for technical safety and environmental protection inspection of automobiles. This module helps learners develop organizational, managerial and operational competencies in automobile diagnostics and repair.

1. **<Automotive Vibration and Noise> <2>**

* *Distribution of learning time: 2(2/0/4)*
* *Former subjects of condition: None*
* *Course* *description*: This module helps students with with basic knowledge of the physical nature, origins and causes of car noise, vibration and impact, and provides diagnostic and diagnostic methods. corrective measures to overcome the above phenomena. This module gives learners the ability to analyze and explain noise phenomena in the process of other declaration and car use..

1. **<Practice of Automotive Diagnostics> <2>**

* *Distribution of learning time: 2(0/2/4)*
* *Former subjects of condition: None*
* *Course* *description*: This module helps students with basic knowledge about the process of diagnostic testing automotive engines. Method of operation and use of engine test equipment, method of using technical documents. 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.

1. **<**Practice of Automotive Body and Paint**> <2>**

* *Distribution of learning time: 2(0/2/4)*
* *Former subjects of condition: None*
* *Course description*: This module helps students with knowledge about automobile body structure, guides learners to practice methods, welding techniques and repairing bodywork, practice processes and preparation methods. surface and tinting, spray paint. This module equips learners with basic skills on organization, operation and implementation of tire repair techniques.

1. **<Practice of Automotive Programming> <2>**

* *Distribution of learning time: 2(0/2/4)*
* *Former subjects of condition: None*
* *Course description*: This module helps students with knowledge of electrical signals in cars (input signals, control outputs), methods of controlling various types of automotive actuators, control algorithms and application of this knowledge to Programming and controlling each specific system.

1. **<Interprise Seminar (AET)> <2>**

* *Distribution of learning time: 2(0/2/4)*
* *Former subjects of condition: None*
* *Course description*: The content of the module includes knowledge related to technical and professional activities and services at enterprises in the field of automotive technology. After completing this module, students can quickly access the working environment at domestic and foreign companies, promptly responding to work requirements at the company.

1. **<Practice of Graduation> <2>**

* *Distribution of learning time: 2(0/2/4)*
* *Former subjects of condition: None*
* *Course description*: This module helps students with 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> <6>**

* *Distribution of learning time: 6(0/6/12)*
* *Former subjects of condition: None*
* *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.** **GUIDANCE FOR IMPLEMENTATION**

The principle for implementation:

- The program is implemented according to the academic schedule (as in item 7).

- If any change, not according to the academic schedule, it must be approved by the Head Program / Academic Advisor.

The time is calculated as follows:

1 theory period = 50 minutes of classroom instruction

1 credit = 15 theory periods for teaching or discussion in class

= 30 hours of testing

= 45 hours of practice

= 45 hours self study

= 90 hours internship

= 45 hours of project implementation or undergraduate thesis.

- Undergraduate thesis: the type of research applied to solve a specific technical problem related to the field of study.

- The sequence of teaching courses should ensure the logic of communication and acquisition of knowledge. The training institutions should provide the prerequisites for the next course in the training program.

- Content: The content of the syllabus is the core content of the course. Depending on the specific discipline, it is possible to add content or time for a particular course.

- Regarding the number of periods in the course: Beside students study in the classrooms, the training institution should add more lessons for the students to consolidate the learned knowledge of the course.

- Regarding to the requirement for the quantity and form of assignments of courses, the instructors have regulations to help students achieving master theoretical knowledge and practice essential skills.

Each course must have a textbook or lecture, reference materials, tutorials, etc., for the students. Depending on the actual conditions of the university, lecturers determine the communication methods: teaching in class, instructor discusses and solves problem in class, at the workshop, at the laboratory, discuss and team work, etc. The lecturers question when watching video in the seminar room and then students write a report.

**PRESIDENT FACULTY DEAN**