****

# PENGESAHAN

**KURIKULUM**

**PROGRAM XXXXXXXXXXXXX**

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| Revisi | : | 02 |
| Tanggal | : |  |
| Dikaji Ulang Oleh | : |  |
| Dikendalikan Oleh | : |  |
| Disetujui Oleh | : | Rektor |

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| NO. DOKUMEN | : |  | | TANGGAL | | : | 1 |
| NO. REVISI | : | 02 | | NO. HAL | | : | - |
| Disiapkan Oleh Ketua Tim Penyusun | | | Diperiksa Oleh  Dekan | | Disahkan Oleh :  Rektor  Ir. Eko Muh Widodo, MT  NIP. 196509131991031002 | | |

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(SK PEMBERLAKUAN)

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Magelang, November 2016

Ketua Program Studi,

xxxxxxxxxxxxxxxxxxxxxxxx

NIDN. xxxxxxxxxxxxxxxxx

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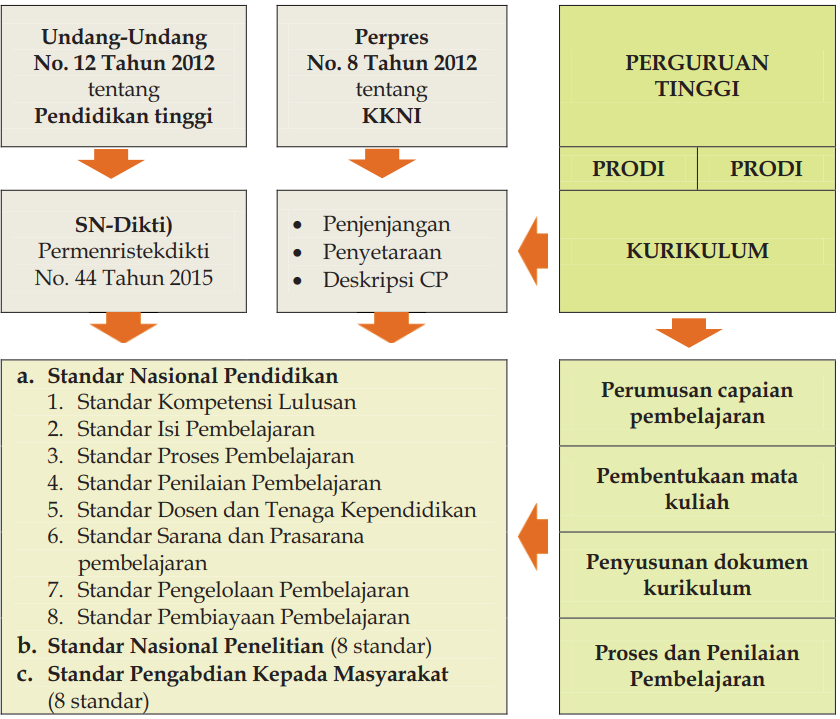
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# PENDAHULUAN

## Dasar Penyusunan kurikulum progam studi

Dalam penyusunan kurikulum ini, Universitas Muhammadiyah Magelang mengacu pada aturan perundangan dan aturan pemerintah seperti yang disajikan dalam gambar 1.1. sebagai berikut.



1. **Statuta UMMagelang**
2. **Pola Ilmiah Pokok (PIP) UMMagelang**
3. **VMTS Program studi Mesin Otomotif**

**Gambar 1.1** Landasan Hukum Penyusunan Kurikulum

## Kerangka Kualifikasi Nasional Indonesia (KKNI)

Secara umum, uraian tentang parameter pembentukan setiap deskriptor KKNI adalah sebagai berikut.

Kemampuan kerja atau kompetensi merupakan kemampuan dalam ranah kognitif, ranah psikomotor, dan ranah afektif yang tercermin secara utuh dalam perilaku atau dalam melaksanakan suatu kegiatan sehingga dalam menetapkan tingkat kompetensi seseorang dapat ditilik lewat unsur - unsur dari kemampuan dalam ketiga ranah tersebut. Pernyataan kemampuan ini tercakup di dalamnya cara/metode yang digunakan, kondisi, serta tingkat kualitas hasil yang harus dicapai. Makin tinggi tingkat kualifikasi dalam KKNI maka kemampuan ini dilengkapi dengan kemampuan memanfaatkan ilmu pengetahuan, keahlian, dan metode yang harus dikuasai dalam melakukan suatu tugas atau pekerjaan tertentu, termasuk di dalamnya adalah keahlian intelektual (intellectual skills).

1. Cakupan keilmuan/pengetahuan merupakan rumusan tingkat keluasan, kedalaman, dan kerumitan/kecanggihan pengetahuan tertentu yang harus dimiliki sehingga makin tinggi kualifikasi seseorang dalam KKNI ini dirumuskan dengan makin luas, makin dalam, dan makin canggih pengetahuan/keilmuan yang dimilikinya. Dengan penguasaan bidang keilmuan/ pengetahuan ini dapat dinyatakan peran yang dapat dilakukannya.
2. Hak/kewenangan dan tanggung jawab (manajerial) merumuskan kemampuan manajerial seseorang dalam melakukan pekerjaan yang didalamnya tercakup hak, tanggung jawab, dan sikap yang dipersyaratkan dalam melakukan suatu tugas atau pekerjaan dalam bidang kerja tersebut.

Berdasarkan Peraturan Presiden Republik Indonesia Nomor 8 Tahun 2012 pasal 5, Penyetaraan capaian pembelajaran yang dihasilkan melalui pendidikan dengan jenjang Program (disesuaikan dengan jenjang akademik program studi yang bersangkutan)

## Capaian Pembelajaran

Kalimat dibawah ini bias diacu atau bisa dikembangkan sesuai dengan prodi.

~~Dalam kurikulum 2016 ini, deskripsi Capaian Pembelajaran (CP) menjadi komponen penting dalam rangkaian penyusunan kurikulum. Sebagaimana telah diungkapkan sebelumnya, CP dapat dipandang sebagai resultan dari hasil Keseluruhan proses belajar yang telah ditempuh oleh seorang pembelajar/mahasiswa selama menempuh studi pada satu program studi.  Unsur capaian pembelajaran mencakup: sikap dan tata nilai, kemampuan, pengetahuan, dan tanggung jawab/hak. Seluruh unsur ini menjadi kesatuan yang saling mengait dan juga membentuk relasi sebab akibat. Secara umum CP dapat melakukanberagam fungsi, diantaranya:~~

1. ~~Sebagai penciri, deskripsi, atau spesifikasi dari Program Studi;~~
2. ~~Sebagai ukuran, rujukan, pembanding pencapaian jenjang pembelajaran dan pendidikan;~~
3. ~~Kelengkapan utama deskripsi dalam  Surat Keterangan Pendamping Ijazah (SKPI); dan~~
4. ~~Sebagai komponen penyusun kurikulum dan pembelajaran.~~

~~Konsep pengembangan capaian pembelajaran dan kurikulum disajikan dalam gambar 1.1. sebagai berikut.~~



**Gambar 1.2** Konsep pengembangan capaian pembelajaran dan kurikulum

Pada tahun 2017 ini, Capaian Pembelajaran Lulusan (CPL) Program Studi xxxxxxxxxx UMMagelang telah ditetapkan melalui **Surat Keputusan Rektor No: XXXXXXXXXXXXXXXXXXX** tanggal xx Xxxxxxxxx xxxx.

## Unsur Capaian Pembelajaran

### Sikap dan tata nilai

~~Merupakan perilaku benar dan berbudaya sebagai hasil internaslisasi dan aktualisasi nilai dan norma yang tercermin dalam kehidupan sosial dan spiritual melalui proses pembelajaran, pengalaman kerja mahasiswa, penelitian, dan atau pengabdian kepada masyarakat yang terkait pembelajaran.~~

### Keterampilan umum

~~Merupakan kemampuan kerja umum yang wajib dimiliki oleh setiap lulusan dalam rangka menjamin kesetaraan kemampuan lulusan sesuai~~ ~~tingkat program dan jenis pendidikan tinggi.~~

### Keterampilan khusus

~~Merupakan kemampuan kerja khusus yang wajib dimiliki oleh setiap lulusan sesuai dengan bidang keilmuan program studi.~~

### Pengetahuan

~~Merupakan penguasaan konsep, teori, metode, dan/atau falsafah bidang ilmu tertentu secara sistematis yang diperoleh melalui penalaran dalam proses pembelajaran, pengalaman kerja mahasiswa, penelitian dan/atau pengabdian kepada masyarakat yang terkait pembelajaran.~~

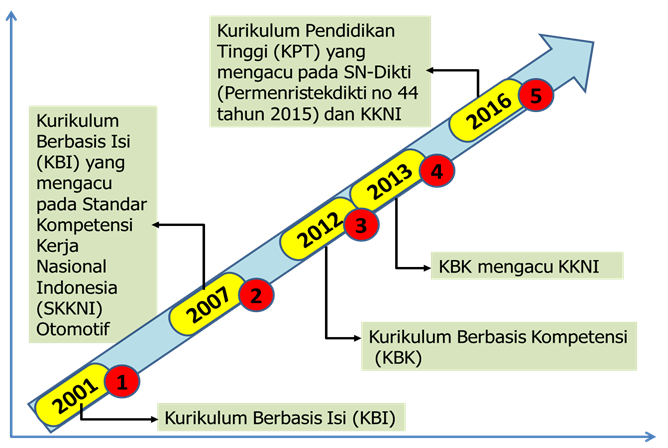
~~Gambaran unsur CPL dalam SN-Dikti disajikan dalam gambar 1.2. sebagai berikut.~~



**Gambar 1.3** Unsur CPL dalam SN-Dikti

## Sejarah dan Perkembangan Kurikulum Program Studi

~~Program Studi xxxxxxxxxxxxxxxx. Selama periode 2001 sampai 2016 ini, telah mengalami perubahan kurikulum sebanyak 4 (empat) kali, seperti yang disajikan dalam gambar 1.2 sebagai berikut.~~



Gambar . Sejarah pengembangan kurikulum xxxxxxxxxxxx UMMagelang

## Definisi dan Pengertian Umum

1. **Kurikulum** adalah seperangkat rencana dan pengaturan mengenai capaian pembelajaran lulusan, bahan kajian, proses, dan penilaian yang digunakan sebagai pedoman penyelenggaraan program studi.
2. **Pendidikan Tinggi** adalah jenjang pendidikan setelah pendidikan menengah yang mencakup program diploma, program sarjana, program magister, program doktor, dan program profesi, serta program spesialis, yang diselenggarakan oleh perguruan tinggi berdasarkan kebudayaan bangsa Indonesia.
3. **Kurikulum Pendidikan Tinggi** dikembangkan oleh setiap Perguruan Tinggi dengan mengacu pada Standar Nasional Pendidikan Tinggi untuk setiap Program Studi yang mencakup pengembangan kecerdasan intelektual, akhlak mulia, dan keterampilan (Pasal 35 : 1). Kurikulum Pendidikan Tinggi untuk program sarjana dan program diploma (Pasal 35 ayat 5) wajib memuat mata kuliah (Pasal 35: 1): 1) Agama; 2) Pancasila; 3) Kewarganegaraan; dan 4) Bahasa Indonesia.
4. **Pembelajaran** adalah proses interaksi mahasiswa dengan dosen dan sumber belajar pada suatu lingkungan belajar.
5. **Program studi** adalah kesatuan kegiatan pendidikan dan pembelajaran yang memiliki kurikulum dan metode pembelajaran tertentu dalam satu jenis pendidikan akademik, pendidikan profesi, dan/atau pendidikan vokasi.
6. **Mata kuliah atau modul** adalah bungkus dari bahan kajian/materi ajar yang dibangun berdasarkan beberapa pertimbangan saat kurikulum disusun. Mata kuliah dapat dibentuk berdasarkan pertimbangan kemandirian materi sebagai cabang / ranting/bahan kajian bidang keilmuan tertentu atau unit keahlian tertentu (parsial), atau pertimbangan pembelajaran terintergrasi dari sekelompok bahan kajian atau sejumlah keahlian (sistem blok) dalam rangka pemenuhan capaian pembelajaran lulusan yang dirumuskan dalam kurikulum.
7. **Rencana pembelajaran semester (RPS)** atau istilah lain suatu mata kuliah adalah rencana proses pembelajaran yang disusun untuk kegiatan pembelajaran selama satu semester guna memenuhi capaian pembelajaran yang dibebankan pada mata kuliah/modul. Rencana pembelajaran semester atau istilah lain, ditetapkan dan dikembangkan oleh dosen secara mandiri atau bersama dalam kelompok keahlian suatu bidang ilmu pengetahuan dan/atau teknologi dalam program studi.
8. **Standar penilaian pembelajaran** merupakan kriteria minimal tentang penilaian proses dan hasil belajar mahasiswa dalam rangka pemenuhan capaian pembelajaran lulusan.

# VISI, MISI, TUJUAN, DAN SASARAN PROGRAM STUDI

## Visi Program Studi

~~JELASKAN SECARA RINCI VISI PRODI~~

## Misi Program Studi

1. ~~Mengembangkan kemampuan dan budaya profesi mahasiswa yang mengarah pada penguasaan Teknologi Kendaraan Efisien melalui sistem Pembelajaran Berbasis Kompetensi~~
2. ~~Melaksanakan penelitian terapan yang terencana, terstruktur, dan sinergi untuk mengembangkan sivitas akademika yang inovatif, kreatif, terampil, dan berdaya saing.~~
3. ~~Melaksanakan pelayanan, pemberdayaan, dan pengabdian kepada masyarakat untuk mengembangkan sivitas akademika yang responsif dan kooperatif.~~
4. ~~Mengembangkan Ilmu Pengetahuan dan Teknologi dengan menerapkan nilai-nilai islam (~~*~~Islamic value~~*~~).~~

## Tujuan Program Studi

1. ~~Dihasilkannya lulusan yang menguasai Teknologi Kendaraan Efisien untuk memenuhi kepentingan nasional dan peningkatan daya saing bangsa;~~
2. ~~Dihasilkannya Ilmu Pengetahuan dan Teknologi melalui penelitian terapan agar bermanfaat bagi kemajuan bangsa dan kesejahteraan masyarakat.~~
3. ~~Terwujudnya pelayanan, pemberdayaan, dan pengabdian kepada masyarakat berbasis penalaran dan implementasi hasil penelitian untuk memberikan kemanfaatan bagi masyarakat.~~
4. ~~Internalisasi nilai-nilai islam (~~*~~Islamic value~~*~~) kedalam seluruh kegiatan caturdharma untuk mengembangkan potensi mahasiswa agar menjadi manusia yang beriman, bertakwa, berakhlak mulia, sehat, berilmu, cakap, kreatif, mandiri,~~ terampil, kompeten, dan berbudaya.

## Rumusan Sasaran dan Strategi Pencapaian

### *Mile Stone* Pengembangan Program Studi

Gambar 2.1. *Mile Stone* pengembangan Program Studi

2014-2024

JELASKAN MILE STONE PENGEMBANGAN PROGRAM STUDI

# MEKANISME PENYUSUNAN KURIKULUM PROGRAM STUDI

## Tahapan Penyusunan Kurikulum

Penyusunan kurikulum di Program Studi XXXXXXXXXXXXXXXXXXXX mengacu pada pedoman penyusunan Kurikulum Pendidikan Tinggi 2016 yang terdiri dari 8 tahapan, dengan urutan seperti pada gambar berikut:



Gambar 3.1. TahapanPenyusunan KPT[[1]](#footnote-1)

## Analisis Kebutuhan

1. Analisis kebutuhan pasar (Market Signal) dan pemangku kepentingan (Satakeholder/Asosiasi)

~~JABARKAN SECARA RINCI MARKET SIGNAL DAN PEMANGKU KEPENTINGAN~~

1. Analisis perkembangan keilmuan dan keahlian program studi

~~JELASKAN SECARA RINCI ARAH PERKEMBANGAN KEILMUAN DAN KEAHLIAN PRODI~~

1. Analisis Scientific Vision program studi

~~JELASKAN SECARA RINCI ANALISIS PENENTUAN SCIENTIFIC VISOON PRODI~~

1. Analisis kebutuhan kualifikasi nasional dan internasional

~~JELASKAN ANALISIS KEBUTUHAN KUALIFIKASI NASIONAL DAN INTERNASIONAL JIKA MEMUNGKINKAN~~

## Profil Lulusan Program Studi

## 

|  |  |  |
| --- | --- | --- |
| No | Profil Lulusan | Deskripsi Profil |
| 1. |  |  |
| 2. |  |  |
| 3. |  |  |
| 4. |  |  |
| 5. | DISKRIPSIKAN PROFIL LULUSAN |  |
|  |  |  |

## Capaian Pembelajaran Lulusan (CPL)

### Sikap (*Attitude*)

|  |  |  |
| --- | --- | --- |
| ~~S.01~~ | ~~Bertakwa kepada Allah dan mampu menunjukkan sikap Islami;~~ | *~~Obedient to Allah and be able to demonstrate the Islamic attitude;~~* |
| ~~S.02~~ | ~~Menjunjung tinggi nilai kemanusiaan dalam menjalankan tugas berdasarkan agama,moral, dan etika;~~ | *~~Respecingt human values in performing tasks based on religion, morals, and ethics;~~* |
| ~~S.03~~ | ~~Berkontribusi dalam peningkatan mutu kehidupan bermasyarakat, berbangsa, bernegara, dan kemajuan peradaban berdasarkan Pancasila;~~ | *~~Contributing in improving quality of life society, nation, state, and civilization based on Pancasila;~~* |
| ~~S.04~~ | ~~Berperan sebagai warga negara yang bangga dan cinta tanah air, memiliki nasionalisme serta rasa tanggungjawab pada negara dan bangsa;~~  SESUAIKAN DENGAN CPL MASING MASING PRODI | *~~Acting as citizens which pride and patriotism, nationalism, and responsibility to the state and nation;~~* |
| ~~S.05~~ | ~~Menghargai keanekaragaman budaya, pandangan, agama, dan kepercayaan, serta pendapat atau temuan orisinal orang lain;~~ | *~~Appreciating cultural diversity, views, religions, beliefs, and opinions or original findings of others;~~* |
| ~~S.06~~ | ~~Bekerja sama dan memiliki kepekaan sosial serta kepedulian terhadap masyarakat dan lingkungan;~~ | *~~Cooperative and have social sensitivity and concerning for the community and the environment;~~* |
| ~~S.07~~ | ~~Taat hukum dan disiplin dalam kehidupan bermasyarakat dan bernegara;~~ | *~~Obey the law and discipline in the life of society and state;~~* |
| ~~S.08~~ | ~~Menginternalisasi nilai-nilai keislaman, norma, dan etika akademik, dan memperjuangkannya melalui pergerakan Muhammadiyah;~~ | *~~Internalizing Islamic values, norms, and academic ethics, and fight through the Muhammadiyah movement;~~* |
| ~~S.09~~ | ~~Menunjukkan sikap bertanggungjawab atas pekerjaan di bidang keahliannya secara mandiri;~~ | *~~Showing an attitude responsible for the work in his field of expertise independently;~~* |
| ~~S.10~~ | ~~Menginternalisasi semangat entrepreneurship islami (inovatif, kreatif, kerjasama, berani mengambil resiko, kemandirian, kejuangan, dan kewirausahaan).~~ | *~~Internalizing the spirit of Entrepreneurship-Islamic (innovative, creative, teamwork, risk-taking, self-reliance, innovation, effort, and entrepreneurship).~~* |

### ~~Ketrampilan Umum (~~*~~General Skills~~*~~)~~

|  |  |  |
| --- | --- | --- |
| ~~KU.01~~ | ~~Mampu menyelesaikan pekerjaan berlingkup luas dan menganalisis data dengan beragam metode yang sesuai, baik yang belum maupun yang sudah baku;~~ | *~~Able to complete wide scope work and analyzing data with a variety of appropriate methods, standard or not yet;~~* |
| ~~KU.02~~ | ~~Mampu menunjukkan kinerja bermutu dan terukur;~~ | *~~Able to demonstrate the quality performance and measurable;~~* |
| ~~KU.03~~ | ~~Mampu memecahkan masalah pekerjaan dengan sifat dan konteks yang sesuai dengan bidang keahlian terapannya didasarkan pada pemikiran logis, inovatif, dan bertanggung jawab atas hasilnya secara mandiri;~~ | *~~Able to solve the problem of work with relevant context to their expertise based on logical thinking, innovative, and responsible for the results independently;~~* |
| ~~KU.04~~ | ~~Mampu menyusun laporan hasil dan proses kerja secara akurat dan sahih serta mengomunikasikannya secara efektif kepada pihak lain yang membutuhkan;~~ | *~~Able to prepare reports accurately and authentically and be able to communicate effectively to others in need;~~* |
| ~~KU.05~~ | ~~Mampu bekerja sama, berkomunikasi, dan berinovatif dalam pekerjaannya;~~ | *~~Able to be cooperative, comunicative, andinovativein the work;~~* |
| ~~KU.06~~ | ~~Mampu bertanggungjawab atas pencapaian hasil kerja kelompok dan melakukan supervisi dan evaluasi terhadap penyelesaian pekerjaan yang ditugaskan kepada pekerja yang berada di bawah tanggungjawabnya;~~  SESUAIKAN DENGAN CPL MASING MASING PRODI | *~~Able to be responsible for the achievement of the group's work and able to supervise the completion of the work assigned to workers who are under their responsibility;~~* |
| ~~KU.07~~ | ~~Mampu melakukan proses evaluasi diri terhadap kelompok kerja yang berada di bawah tanggung jawabnya, dan mengelola pengembangan kompetensi kerja secara mandiri;~~ | *~~Able to perform self-evaluation process of the working groups under their responsibility, and able to manage competency development work independently;~~* |
| ~~KU.08~~ | ~~Mampu mendokumentasikan, menyimpan, mengamankan, dan menemukan kembali data untuk menjamin kesahihan dan mencegah plagiasi.~~ | *~~Able to keep, store, use, and found back of data to ensure the validity and prevent plagiarism.~~* |
| ~~KU.09~~ | ~~Menguasai bahasa asing untuk mendukung pekerjaan.~~ | *~~Mastering anenglish language to support the work~~* |
| ~~KU.10~~ | ~~Menguasai aplikasi komputer dan~~  ~~teknologi informasi untuk mendukung pekerjaan.~~ | *~~Mastering of computer applications and information technology to support the work.~~* |
| ~~KU.11~~ | ~~Mampu membangun customer dan network.~~ | *~~Able to build customer and network~~* |

### ~~Ketetampilan Khusus (~~*~~Specific Skills~~*~~)~~

|  |  |  |
| --- | --- | --- |
| ~~KK.01~~ | ~~Mampu menilai dan menganalisis kondisi kendaraan berdasarkan informasi dari konsumen dan data servis yang ada.~~ | *~~Able to assess and analyze the vehicle condition based on information from consumers and services data available.~~* |
| ~~KK.02~~ | ~~Mampu merumuskan hasil analisis kondisi kendaraan dalam sebuah perintah kerja (~~*~~service order~~*~~).~~ | *~~Able to formulate the results of analysis of the vehicle condition in a service order.~~* |
| ~~KK.03~~ | ~~Mampu mengembangkan pekerjaan dengan menggali permasalahan berdasarkan data dan fakta pada kendaraan yang ditangani.~~ | *~~Able to develop the work by digging a problem based on data and facts of vehicles handled.~~*  SESUAIKAN DENGAN CPL MASING MASING PRODI |
| ~~KK.04~~ | ~~Mampu mengestimasi biaya servis.~~ | *~~Able to estimate the vehicle service costs.~~* |
| ~~KK.05~~ | ~~Mampu memastikan kebenaran pekerjaan servis.~~ | *~~Able to ensure the correctness of vehicle service works.~~* |
| ~~KK.06~~ | ~~Mampu melaksanakan prosedur Maintenance-Repair-Overhaul (M-R-O) kendaraan dari beragam metode secara profesional.~~ | *~~Able to carry out the procedure Maintenance-Repair-Overhaul (M-R-O) by various methods in a professional manner.~~* |
| ~~KK.07~~ | ~~Mampu menggunakan dan merawat service equipment secara tepat dan aman.~~ | *~~Able to use and maintain service equipment correctly and safely.~~* |
| ~~KK.08~~ | ~~Mampu mengembangkan technical skill dengan beragam metode.~~ | *~~Able to develop technical skill by variety methods.~~* |
| ~~KK.09~~ | ~~Mampu melaksanakan pengujian berbagai macam tipe kendaraan dengan beragam metode, menganalisis hasil uji, dan membandingkannya dengan standar yang ditentukan untuk membuat keputusan.~~ | *~~Able to carry out of various vehicle testings with various methods, analyze test results, and compare them with prescribed standards for making decisions.~~* |
| ~~KK.10~~ | ~~Mampu mengelola workshop dengan pelayanan terstandar dan taat asas (kebijakan, lingkungan, sosial, dan finansial).~~ | *~~Able to manage the workshop with standardized servicesand adhere to the principles (policy, environmental, social, and financial).~~* |
| ~~KK.11~~ | ~~Mampu menginovasi teknologi otomotif yang mengarah pada peningkatan efisiensi (material, energi, dan biaya).~~ | *~~Able to carry out innovative automotive technologies that lead to increasing efficiency (material, energy, and cost).~~* |

### ~~Pengetahuan (~~*~~Knowledge~~*~~)~~

|  |  |  |
| --- | --- | --- |
| ~~P.01~~ | ~~Menguasai product knowledge dan sistem pada kendaraan untuk menganalisis permasalahan dan memformulasikan perintah kerja (service order).~~ | *~~Mastering product knowledge and vehicle systems to analyze problems and to formulate service order~~*  SESUAIKAN DENGAN CPL MASING MASING PRODI |
| ~~P.02~~ | ~~Menguasai manajemen biaya untuk membuat estimasi biaya servis.~~ | *~~Mastering cost management to make the estimated service costs.~~* |
| ~~P.03~~ | ~~Menguasai konsep dasar teknik kendaraan dan pengetahuan Hi-Tech Otomotif~~ | *~~Mastering basic concepts of automotive engineering and Hi-Tech Automotive knowledge~~* |
| ~~P.04~~ | ~~Menguasai dasar-dasar kepemimpinan untuk menggerakkan kelompok kerja~~ | *~~Mastering the fundamentals of leadership to drive the working group~~* |
| ~~P.05~~ | ~~Menguasai konsep dasar pengukuran dan pengujian kendaraan.~~ | *~~Mastering the basic concepts of measurement and vehicle testing.~~* |
| ~~P.06~~ | ~~Menguasai Standardisasi & Regulasi Otomotif untuk membuat keputusan dari hasil pengujian.~~ | *~~Mastering automotive standardization &regulation to make a test decision.~~* |
| ~~P.07~~ | ~~Menguasai skenario pengembangan otomotif jangka panjang.~~ | *~~Mastering the long-term automotive development scenario.~~* |
| ~~P.08~~ | ~~Menguasai tata kelola dan administrasi bengkel profesional.~~ | *~~Mastering professioonal workshop management and administration~~* |
| ~~P.09~~ | ~~Menguasai dasar dasar kewirausahaan.~~ | *~~Mastering the basics of entrepreneurship.~~* |

## Pemilihan Bahan Kajian

### Rumusan bahan kajian

| **JENIS BAHAN KAJIAN** | **BAHAN KAJIAN** |
| --- | --- |
| **INTI KEILMUAN (S1, S2 DAN S3/ BIDANG KEAHLIAN PROGRAM STUDI** | Product Knowledge & Automotive equipment |
| Service data and form |
| Automotive metrology |
| Automotive measurement tools |
| Engine geometry |
| Piston and crank |
| Valve mechanism |
| Fly wheel |
| Fuel supply system |
| Cooling system |
| Lubricating system |
| Ignition system |
| Charging system |
| Start up system |
| Bsic Gasoline EMS |
| Gasoline Engine & Vehicle sensors |
| Gasoline Engine & Vehicle actuators |
| Gasoline ECU process & Wiring systems |
| Diesel EMS |
| Diesel Engine & Vehicle sensors |
| Diesel Engine & Vehicle actuators |
| Diesel ECU process & wiring systems |
| Electrical symbols and wiring diagrams |
| Auto-Lighting |
| Wiper & Washer |
| Heater & Ventilation System |
| Air Conditioning system |
| Audio & Video |
| Electric Mirror |
| Power Windows |
| Central lock |
| Air Bag |
| Immobilizer system |
| Steering system |
| Brake system |
| Suspension system |
| Wheel Alignment |
| Automatic transmission |
| Drivetrain mechanism |
| Engine performance |
| Engine testing |
| Vehicle testing |
| **IPTEKS PENDUKUNG** | Material properties |
| Material for Automotive parts |
| Material process for automotive parts |
| Fluid properties |
| Fluid statics |
| Fluid dynamics |
| Basic electrics |
| Basic electronics |
| Automotive industry standard & regulation |
| Vehicle dimension standard & regulation |
| Vehicle equipment regulation |
| Emission regulation |
| Transportion regulation |
| Algorithm for control |
| Algebra & Graph |
| Geometry & trigonometry |
| Motion, speed, & acceleration |
| Newton's Law |
| Stress in Auto-Parts |
| Torsional & Bending Stresses in Auto-parts |
| Variable stress in Auto-parts |
| Joint in Auto-part |
| Key & Coupling |
| Gear, belt, chain, & pully |
| Vehicle dynamics |
| Vibration |
| Balancing |
| Mass transfer |
| Model of heat transfer |
| Concept of heat transfer coeficien |
| Thermodynamics law and properties |
| Energy equilibrium |
| Reversible and irreversible system |
| Thermodynamics fluids |
| Combustion process and energy delivery |
| Emission analysis |
|  |  |
| **IPTEKS PELENGKAP** | Data Processing & displaying |
| Data & Graph Analysis |
| Computer application for scientific writing |
| Computer application for statistics |
| Computer application for simulation |
| Drawing instruments, equipment & materials |
| Graphical communication |
| Construction of simple geometrical figures & shapes |
| Isometric and oblique projections |
| Single orthographic projections |
| Engineering for engineering |
| English for communication |
| Bussines Opportunity & Challange |
| Vision building |
| Leadership |
| Innovation management |
| Cost analysis |
| Bussines plan |
| Resource management |
| Safety management |
| Workshop facility management |
| Part & Waste Management |
| Customer Service Satisfied |
| Mechanic Qualification Frame Work |
| SOP of services |
| Responsibilities of automotive technicians |
| Code ethics of engineer & technician |
| Code ethics of automotive instructor |
| Code ethics of enterpreneur |
| **IPTEKS YANG DIKEMBANGKAN** | Natural gas vehicles |
| LPG Vehicles |
| Biofuels |
| Exhaust gas reduction |
| Signal, Actuator, & wiring |
| Control systems |
| Microcontroller |
| Data acquisition |
| Embeded Systems |
| **IPTEKS MASA DEPAN** | Engine performance enhancement |
| Low emissions vehicles (LEVs) |
| Ultra-low emission vehicles (ULEVs) |
| Smart Vehicles |
| Zero Emission Vehicles |
| Hydrogen cycles |
| **WAJIB NASIONAL + *UNIVERSITY VALUES*** | Konsep dan Urgensi Pendidikan Pancasila |
| Sumber Historis, Sosiologis, Politik Pend. Pancasila |
| Konsep dan Urgensi Pancasila dalam Arus Sejarah Bangsa |
| Dinamika dan Tantangan Pancasila sebagai Dasar Negara |
| Pancasila sebagai Ideologi Negara |
| Pancasila sebagai Sistem Filsafat |
| Konsep dan Urgensi Pancasila sebagai Sistem Etika |
| Pancasila sebagai Dasar Nilai Pengembangan Ilmu |
| Konsep dan Urgensi Pendidikan Kewarganegaraan dalam  Pencerdasan Kehidupan Bangsa |
| Konsep dan Urgensi Identitas dan Integrasi nasional |
| Konsep dan Urgensi Konstitusi dalam Kehidupan Berbangsa- Negara |
| Konsep dan Urgensi Harmoni Kewajiban dan Hak Negara dan Warga Negara |
| Konsep dan Urgensi Demokrasi yang Bersumber dari Pancasila |
| Konsep dan Urgensi Penegakan Hukum yang Berkeadilan |
| Konsep dan Urgensi Wawawan Nusantara |
| Konsep dan Urgensi Ketahanan Nasional dan Bela Negara |
| Bahasa indonesia; tata tulis ilmiah |
| AIK 1 : Kemanusiaan dan keimanan |
| AIK 2: Ibadah, akhlak dan muamalah |
| AIK 3 : Kemuhammadiyahan |
| AIK 4 : Islam dan Ilmu Pengetahuan |
| **WAJIB UNIVERSITAS** | On The Job Training (OJT) |
| Final Project (FP) |

### Matrik hubungan bahan kajian terhadap CPL keterampilan khusus

~~TULISKAN MATRIX BAHAN KAJIAN TERHADAP CPL~~

| **BAHAN KAJIAN** | **WAKTU** | **KK.01** | **KK.02** | **KK.03** | **KK.04** | **KK.05** | **KK.06** | **KK.07** | **KK.08** | **KK.09** | **KK.10** | **KK.11** |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Product Knowledge & Automotive equipment | 680 | √ |  |  |  |  |  |  |  | √ |  |  |
| Service data and form | 680 |  | √ | √ | √ | √ |  |  |  |  |  |  |
| Automotive metrology | 1020 |  |  |  |  |  |  | √ |  |  |  |  |
| Automotive measurement tools | 3060 |  |  |  |  |  |  | √ |  | √ |  |  |
| Engine geometry | 680 |  |  |  |  |  | √ |  |  |  |  |  |
| Piston and crank | 2040 |  |  |  |  |  | √ |  |  |  |  |  |
| Valve mechanism | 2040 |  |  |  |  |  | √ |  |  |  |  |  |
| Fly wheel | 680 |  |  |  |  |  | √ |  |  |  |  |  |
| Fuel supply system | 2720 | √ |  |  |  |  | √ |  |  |  |  |  |
| Cooling system | 1360 | √ |  |  |  |  | √ |  |  |  |  |  |
| Lubricating system | 1360 | √ |  |  |  |  | √ |  |  |  |  |  |
| Ignition system | 2720 | √ |  |  |  |  | √ |  |  |  |  |  |
| Charging system | 1360 | √ |  |  |  |  | √ |  |  |  |  |  |
| Start up system | 1360 | √ |  |  |  |  | √ |  |  |  |  |  |
| Bsic Gasoline EMS | 2720 | √ |  |  |  |  | √ |  |  |  |  |  |
| Gasoline Engine & Vehicle sensors | 2720 |  |  |  |  |  | √ |  |  |  |  |  |
| Gasoline Engine & Vehicle actuators | 2720 |  |  |  |  |  | √ |  |  |  |  |  |
| Gasoline ECU process & Wiring systems | 2720 |  |  |  |  |  | √ |  |  |  |  |  |
| Diesel EMS | 2720 | √ |  |  |  |  | √ |  |  |  |  |  |
| Diesel Engine & Vehicle sensors | 2720 |  |  |  |  |  | √ |  |  |  |  |  |
| Diesel Engine & Vehicle actuators | 2720 |  |  |  |  |  | √ |  |  |  |  |  |
| Diesel ECU process & wiring systems | 2720 |  |  |  |  |  | √ |  |  |  |  |  |
| Electrical symbols and wiring diagrams | 1360 | √ |  | √ |  |  | √ |  |  |  |  |  |
| Auto-Lighting | 5440 |  |  |  |  |  | √ |  |  |  |  |  |
| Wiper & Washer | 4080 |  |  |  |  |  | √ |  |  |  |  |  |
| Heater & Ventilation System | 4080 | √ |  |  |  |  | √ |  |  |  |  |  |
| Air Conditioning system | 6800 | √ |  |  |  |  | √ |  |  |  |  |  |
| Audio & Video | 1020 | √ |  |  |  |  | √ |  |  |  |  |  |
| Electric Mirror | 680 | √ |  |  |  |  | √ |  |  |  |  |  |
| Power Windows | 1020 | √ |  |  |  |  | √ |  |  |  |  |  |
| Central lock | 680 | √ |  |  |  |  | √ |  |  |  |  |  |
| Air Bag | 1020 | √ |  |  |  |  | √  CONTOH MATRIX HUBUNGAN BAHAN KAJIAN TERHADAP CPL |  |  |  |  |  |
| Immobilizer system | 1020 | √ |  |  |  |  | √ |  |  |  |  |  |
| Steering system | 2720 | √ |  |  |  |  | √ |  |  |  |  |  |
| Brake system | 2720 | √ |  |  |  |  | √ |  |  |  |  |  |
| Suspension system | 2720 | √ |  |  |  |  | √ |  |  |  |  |  |
| Wheel Alignment | 2720 | √ |  |  |  |  | √ |  |  |  |  |  |
| Automatic transmission | 2720 | √ |  |  |  |  | √ |  |  |  |  |  |
| Drivetrain mechanism | 2720 | √ |  |  |  |  | √ |  |  |  |  |  |
| Engine performance | 2040 |  |  |  |  |  |  |  |  | √ |  |  |
| Engine testing | 1700 |  |  |  |  |  |  |  |  | √ |  |  |
| Vehicle testing | 1700 |  |  |  |  |  |  |  |  | √ |  |  |
| Automotive industry standard & regulation | 680 |  |  |  |  |  |  |  |  | √ |  |  |
| Vehicle dimension standard & regulation | 680 |  |  |  |  |  |  |  |  | √ |  |  |
| Vehicle equipment regulation | 1360 |  |  |  |  |  |  |  |  | √ |  |  |
| Emission regulation | 1360 |  |  |  |  |  |  |  |  | √ |  |  |
| Transportion regulation | 1360 |  |  |  |  |  |  |  |  | √ |  |  |
| Emission analysis | 680 |  |  |  |  | √ |  |  |  |  |  |  |
| Data Processing & displaying | 680 |  | √ |  |  |  |  |  |  |  |  |  |
| Computer application for simulation | 1360 |  |  |  |  |  |  |  |  |  |  | √ |
| Drawing instruments, equipment & materials | 680 |  |  |  |  | CONTOH MATRIX HUBUNGAN BAHAN KAJIAN TERHADAP CPL |  |  |  |  |  | √ |
| Graphical communication | 1020 |  |  |  |  |  |  |  |  |  |  | √ |
| Construction of simple geometrical figures & shapes | 1700 |  |  |  |  |  |  |  |  |  |  | √ |
| Isometric and oblique projections | 1020 |  |  |  |  |  |  |  |  |  |  | √ |
| English for communication | 5440 |  |  |  |  |  |  |  |  |  | √ |  |
| Bussines Opportunity & Challange | 680 |  |  |  |  |  |  |  |  |  | √ |  |
| Vision building | 340 |  |  |  |  |  |  |  |  |  | √ |  |
| Leadership | 340 |  |  |  |  |  |  |  |  |  | √ |  |
| Innovation management | 1360 |  |  |  |  |  |  |  |  |  | √ |  |
| Cost analysis | 1360 |  |  |  |  |  |  |  |  |  | √ |  |
| Bussines plan | 1360 |  |  |  |  |  |  |  |  |  | √ |  |
| Resource management | 680 |  |  |  |  |  |  |  |  |  | √ |  |
| Safety management | 680 |  |  |  |  |  |  |  |  |  | √ |  |
| Workshop facility management | 1360 |  | √ |  |  |  |  |  |  |  | √ |  |
| Part & Waste Management | 1360 |  |  | √ |  |  |  |  |  |  | √ |  |
| Customer Service Satisfied | 680 |  |  |  |  |  |  |  | √ |  |  |  |
| Mechanic Qualification Frame Work | 680 | √ | √ | √ | √ | √ |  |  |  |  |  |  |
| Natural gas vehicles | 1360 |  |  |  |  |  |  |  |  |  |  | √ |
| LPG Vehicles | 1360 |  |  |  |  |  |  |  |  |  |  | √ |
| Biofuels | 1360 |  |  |  |  |  |  |  |  |  |  | √ |
| Exhaust gas reduction | 1360 |  |  |  |  |  |  |  |  |  |  | √ |
| Signal, Actuator, & wiring | 1360 |  |  |  |  |  |  |  |  |  |  | √ |
| Control systems | 2720 |  |  |  |  |  |  |  |  |  |  | √ |
| Microcontroller | 2720 |  |  |  |  |  |  |  |  |  |  | √ |
| Data acquisition | 1360 |  |  |  |  |  |  |  |  |  |  | √ |
| Embeded Systems | 2720 |  |  |  |  |  |  |  |  |  |  | √ |
| Engine performance enhancement | 680 |  |  |  |  |  |  |  |  |  |  | √ |
| Low emissions vehicles (LEVs) | 680 |  |  |  |  |  |  |  |  |  |  | √ |
| Ultra-low emission vehicles (ULEVs) | 680 |  |  |  |  |  |  |  |  |  |  | √ |
| Smart Vehicles | 1360 |  |  |  |  |  |  |  |  |  |  | √ |
| Zero Emission Vehicles | 1020 |  |  |  |  |  |  |  |  |  |  | √ |
| Hydrogen cycles | 1020 |  |  |  |  |  |  |  |  |  |  | √ |
| Low emissions vehicles (LEVs) | 680 |  |  |  |  |  |  |  |  |  |  | √ |
| Ultra-low emission vehicles (ULEVs) | 680 |  |  |  |  |  |  |  |  |  |  | √ |
| Smart Vehicles | 1360 |  |  |  |  |  |  |  |  |  |  | √ |

### Matrik hubungan bahan kajian terhadap CPL Pengetahuan

| **Bahan kajian** | **WAKTU (menit)** | **P.01** | **P.02** | **P.03** | **P.04** | **P.05** | **P.06** | **P.07** | **P.08** | **P.09** |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Product Knowledge & Automotive equipment | 680 | √ |  |  |  |  |  |  |  |  |
| Service data and form | 680 |  | √ |  |  |  |  |  |  |  |
| Automotive metrology | 1020 |  |  |  |  | √ |  |  |  |  |
| Automotive measurement tools | 3060 |  |  |  |  | √ |  |  |  |  |
| Engine geometry | 680 |  |  | √ |  |  |  |  |  |  |
| Piston and crank | 2040 |  |  | √ |  |  |  |  |  |  |
| Valve mechanism | 2040 |  |  | √ |  |  |  |  |  |  |
| Fly wheel | 680 |  |  | √ |  |  |  |  |  |  |
| Fuel supply system | 2720 | √ |  | √ |  |  |  |  |  |  |
| Cooling system | 1360 | √ |  | √ |  |  |  |  |  |  |
| Lubricating system | 1360 | √ |  | √ |  |  |  |  |  |  |
| Ignition system | 2720 | √ |  | √ |  |  |  |  |  |  |
| Charging system | 1360 | √ |  | √ |  |  |  |  |  |  |
| Start up system | 1360 | √ |  | √ |  |  |  |  |  |  |
| Bsic Gasoline EMS | 2720 | √ |  | √ |  |  |  |  |  |  |
| Gasoline Engine & Vehicle sensors | 2720 |  |  | √ |  |  |  |  |  |  |
| Gasoline Engine & Vehicle actuators | 2720 |  |  | √ |  |  |  |  |  |  |
| Gasoline ECU process & Wiring systems | 2720 |  |  | √ |  |  |  |  |  |  |
| Diesel EMS | 2720 | √ |  | √ |  |  |  |  |  |  |
| Diesel Engine & Vehicle sensors | 2720 |  |  | √ |  |  |  |  |  |  |
| Diesel Engine & Vehicle actuators | 2720 |  |  | √ |  |  |  |  |  |  |
| Diesel ECU process & wiring systems | 2720 |  |  | √ |  |  |  |  |  |  |
| Electrical symbols and wiring diagrams | 1360 | √ |  | √ |  |  |  |  |  |  |
| Auto-Lighting | 5440 |  |  | √ |  |  |  |  |  |  |
| Wiper & Washer | 4080 |  |  | √ |  |  |  |  |  |  |
| Heater & Ventilation System | 4080 | √ |  | √ |  |  |  |  |  |  |
| Air Conditioning system | 6800 | √ |  | √ |  |  |  |  |  |  |
| Audio & Video | 1020 | √ |  | √ |  |  |  |  |  |  |
| Electric Mirror | 680 | √ |  | √ |  |  |  |  |  |  |
| Power Windows | 1020 | √ |  | √ |  |  |  |  |  |  |
| Central lock | 680 | √ |  | √ |  |  |  |  |  |  |
| Air Bag | 1020 | √ |  | √ |  |  |  |  |  |  |
| Immobilizer system | 1020 | √ |  | √ |  |  |  |  |  |  |
| Steering system | 2720 | √ |  | √ |  |  |  |  |  |  |
| Brake system | 2720 | √ |  | √ |  |  |  |  |  |  |
| Suspension system | 2720 | √ |  | √ |  |  |  |  |  |  |
| Wheel Alignment | 2720 | √ |  | √ |  |  |  |  |  |  |
| Automatic transmission | 2720 | √ |  | √ |  |  |  |  |  |  |
| Drivetrain mechanism | 2720 | √ |  | √ |  |  |  |  |  |  |
| Engine performance | 2040 |  |  |  |  | √ |  |  |  |  |
| Engine testing | 1700 |  |  |  |  | √ |  |  |  |  |
| Vehicle testing | 1700 |  |  |  |  | √ |  |  |  |  |
| Material properties | 680 |  |  | √ |  |  |  |  |  |  |
| Material for Automotive parts | 2380 |  |  | √ |  |  |  |  |  |  |
| Material process for automotive parts | 2380 |  |  | √ |  |  |  |  |  |  |
| Fluid properties | 1360 |  |  | √ |  |  |  |  |  |  |
| Fluid statics | 2040 |  |  | √ |  |  |  |  |  |  |
| Fluid dynamics | 2040 |  |  | √ |  |  |  |  |  |  |
| Basic electrics | 5440 |  |  | √ |  |  |  |  |  |  |
| Basic electronics | 5440 |  |  | √ |  |  |  |  |  |  |
| Automotive industry standard & regulation | 680 |  |  |  |  |  | √ |  |  |  |
| Vehicle dimension standard & regulation | 680 |  |  |  |  |  | √ |  |  |  |
| Vehicle equipment regulation | 1360 |  |  |  |  |  | √ |  |  |  |
| Emission regulation | 1360 |  |  |  |  |  | √ |  |  |  |
| Transportion regulation | 1360 |  |  |  |  |  | √ |  |  |  |
| Algorithm for control | 1360 |  |  | √ |  |  |  |  |  |  |
| Algebra & Graph | 2040 |  |  | √ |  |  |  |  |  |  |
| Geometry & trigonometry | 1360 |  |  | √ |  |  |  |  |  |  |
| Motion, speed, & acceleration | 680 |  |  | √ |  |  |  |  |  |  |
| Newton's Law | 680 |  |  | √ |  |  |  |  |  |  |
| Stress in Auto-Parts | 680 |  |  | √ |  |  |  |  |  |  |
| Torsional & Bending Stresses in Auto-parts | 680 |  |  | √ |  |  |  |  |  |  |
| Variable stress in Auto-parts | 680 |  |  | √ |  |  |  |  |  |  |
| Joint in Auto-part | 680 |  |  | √ |  |  |  |  |  |  |
| Key & Coupling | 680 |  |  | √ |  |  |  |  |  |  |
| Gear, belt, chain, & pully | 1360 |  |  | √ |  |  |  |  |  |  |
| Vehicle dynamics | 2720 |  |  | √ |  |  |  |  |  |  |
| Vibration | 1360 |  |  | √ |  |  |  |  |  |  |
| Balancing | 1360 |  |  | √ |  |  |  |  |  |  |
| Mass transfer | 1360 |  |  | √ |  |  |  |  |  |  |
| Model of heat transfer | 2720 |  |  | √ |  |  |  |  |  |  |
| Concept of heat transfer coeficien | 1360 |  |  | √ |  |  |  |  |  |  |
| Thermodynamics law and properties | 680 |  |  | √ |  |  |  |  |  |  |
| Energy equilibrium | 680 |  |  | √ |  |  |  |  |  |  |
| Reversible and irreversible system | 680 |  |  | √ |  |  |  |  |  |  |
| Thermodynamics fluids | 1360 |  |  | √ |  |  |  |  |  |  |
| Combustion process and energy delivery | 1360 |  |  | √ |  |  |  |  |  |  |
| English for communication | 5440 |  |  |  |  |  |  |  |  | √ |
| Bussines Opportunity & Challange | 680 |  |  |  |  |  |  |  |  | √ |
| Vision building | 340 |  |  |  | √ |  |  |  |  | √ |
| Leadership | 340 |  |  |  |  |  |  |  |  | √ |
| Innovation management | 1360 |  | √ |  |  |  |  |  |  | √ |
| Cost analysis | 1360 |  |  |  |  |  |  |  |  | √ |
| Bussines plan | 1360 |  |  |  |  |  |  |  | √ | √ |
| Resource management | 680 |  |  |  |  |  |  |  | √ | √ |
| Safety management | 680 |  |  |  |  |  |  |  | √ | √ |
| Workshop facility management | 1360 |  |  |  |  |  |  |  | √ | √ |
| Part & Waste Management | 1360 |  |  |  |  |  |  |  | √ | √ |
| Mechanic Qualification Frame Work | 680 |  |  |  |  |  |  |  | √ | √ |
| SOP of services | 680 |  |  |  |  |  |  |  | √ | √ |
| Responsibilities of automotive technicians | 1360 |  |  |  |  |  |  |  | √ | √ |
| Code ethics of engineer & technician | 1360 |  |  |  |  |  |  |  | √ | √ |
| Code ethics of automotive instructor | 1020 |  |  |  |  |  |  |  | √ | √ |
| Code ethics of enterpreneur | 1020 |  |  | √ |  |  |  | √ |  |  |
| Natural gas vehicles | 1360 |  |  |  |  |  |  | √ |  |  |
| LPG Vehicles | 1360 |  |  |  |  |  |  | √ |  |  |
| Biofuels | 1360 |  |  | √ |  |  |  | √ |  |  |
| Exhaust gas reduction | 1360 |  |  | √ |  |  |  | √ |  |  |
| Signal, Actuator, & wiring | 1360 |  |  |  |  |  |  | √ |  |  |
| Control systems | 2720 |  |  | √ |  |  |  | √ |  |  |
| Microcontroller | 2720 |  |  | √ |  |  |  | √ |  |  |
| Data acquisition | 1360 |  |  | √ |  |  |  | √ |  |  |
| Embeded Systems | 2720 |  |  | √ |  |  |  | √ |  |  |
| Engine performance enhancement | 680 |  |  | √ |  |  |  | √ |  |  |
| Low emissions vehicles (LEVs) | 680 |  |  | √ |  |  |  |  |  |  |
| Ultra-low emission vehicles (ULEVs) | 680 |  |  | √ |  |  |  |  |  |  |

### Matrik hubungan bahan kajian terhadap CPL Keterampilan Umum

|  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Bahan kajian | WAKTU (menit) | KU.01 | KU.02 | KU.03 | KU.04 | KU.05 | KU.06 | KU.07 | KU.08 | KU.09 | KU.10 | KU.11 |
| Data Processing & displaying | 680 |  |  |  | √ |  |  |  |  |  | √ |  |
| Data & Graph Analysis | 680 |  |  |  | √ |  |  |  |  |  | √ |  |
| Computer application for scientific writing | 1360 |  |  |  | √ |  |  |  | √ |  | √ |  |
| Computer application for statistics | 1360 |  |  |  | √ |  |  |  |  |  | √ |  |
| Computer application for simulation | 1360 |  |  |  | √ |  |  |  |  |  | √ |  |
| Drawing instruments, equipment & materials | 680 |  |  |  |  |  |  |  |  | √ |  |  |
| Graphical communication | 1020 |  |  |  |  |  |  |  |  | √ |  |  |
| Single orthographic projections | 1020 |  |  |  |  |  |  |  |  | √ |  |  |
| Engineering for engineering | 5440 |  |  |  |  |  |  |  |  | √ |  |  |
| English for communication | 5440 |  |  |  |  |  |  |  |  | √ |  |  |
| Bussines Opportunity & Challange | 680 |  |  |  |  |  |  |  |  |  |  | √ |
| Vision building | 340 |  |  |  |  |  |  |  |  |  |  | √ |
| Leadership | 340 |  |  |  |  |  |  |  |  |  |  | √ |
| Bahasa Indonesia: tata tulis ilmiah | 5440 |  |  |  | √ |  |  |  | √ |  |  |  |
| ON THE JOB TRAINING | 32640 |  |  |  |  | √ |  |  |  |  |  |  |
| FINAL PROJECT | 21760 |  |  |  | √ | √ |  |  | √ | √ | √ | √ |

Keterangan : = Soft skill

### Matrik hubungan bahan kajian terhadap CPL sikap dan tata nilai

| **Bahan kajian** | **WAKTU (menit)** | **S.01** | **S.02** | **S.03** | **S.04** | **S.05** | **S.06** | **S.07** | **S.08** | **S.09** | **S.10** |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Konsep dan Urgensi Pendidikan Pancasila | 680 |  | √ | √ | √ | √ | √ | √ |  | √ | √ |
| Sumber Historis, Sosiologis, Politik Pend. Pancasila | 680 |  | √ | √ | √ | √ | √ | √ |  | √ | √ |
| Konsep dan Urgensi Pancasila dalam Arus Sejarah Bangsa | 680 |  | √ | √ | √ | √ | √ | √ |  | √ | √ |
| Dinamika dan Tantangan Pancasila sebagai Dasar Negara | 680 |  | √ | √ | √ | √ | √ | √ |  | √ | √ |
| Pancasila sebagai Ideologi Negara | 680 |  | √ | √ | √ | √ | √ | √ |  | √ | √ |
| Pancasila sebagai Sistem Filsafat | 680 |  | √ | √ | √ | √ | √ | √ |  | √ | √ |
| Konsep dan Urgensi Pancasila sebagai Sistem Etika | 680 |  | √ | √ | √ | √ | √ | √ |  | √ | √ |
| Pancasila sebagai Dasar Nilai Pengembangan Ilmu | 680 |  | √ | √ | √ | √ | √ | √ |  | √ | √ |
| Konsep dan Urgensi Pendidikan Kewarganegaraan dalam Pencerdasan Kehidupan Bangsa | 680 |  | √ | √ | √ | √ | √ | √ |  | √ | √ |
| Konsep dan Urgensi Identitas dan Integrasi nasional | 680 |  | √ | √ | √ | √ | √ | √ |  | √ | √ |
| Konsep dan Urgensi Konstitusi dalam Kehidupan Berbangsa-Negara | 680 |  | √ | √ | √ | √ | √ | √ |  | √ | √ |
| Konsep dan Urgensi Harmoni Kewajiban dan Hak Negara dan Warga Negara | 680 |  | √ | √ | √ | √ | √ | √ |  | √ | √ |
| Konsep dan Urgensi Demokrasi yang Bersumber dari Pancasila | 680 |  | √ | √ | √ | √ | √ | √ |  | √ | √ |
| Konsep dan Urgensi Penegakan Hukum yang Berkeadilan | 680 |  | √ | √ | √ | √ | √ | √ |  | √ | √ |
| Konsep dan Urgensi Wawawan Nusantara | 680 |  | √ | √ | √ | √ | √ | √ |  | √ | √ |
| Konsep dan Urgensi Ketahanan Nasional dan Bela Negara | 680 |  | √ | √ | √ | √ | √ | √ |  | √ | √ |
| AIK 1 : Kemanusiaan dan keimanan | 5440 | √ | √ | √ | √ | √ | √ | √ | √ | √ | √ |
| AIK 2: Ibadah, akhlak dan muamalah | 5440 | √ | √ | √ | √ | √ | √ | √ | √ | √ | √ |
| AIK 3 : Kemuhammadiyahan | 5440 | √ | √ | √ | √ | √ | √ | √ | √ | √ | √ |
| AIK 4 : Islam dan Ilmu Pengetahuan | 5440 | √ | √ | √ | √ | √ | √ | √ | √ | √ | √ |
| Konsep dan Urgensi Pendidikan Pancasila | 680 |  | √ | √ | √ | √ | √ | √ |  | √ | √ |
| Sumber Historis, Sosiologis, Politik Pend. Pancasila | 680 |  | √ | √ | √ | √ | √ | √ |  | √ | √ |
| Konsep dan Urgensi Pancasila dalam Arus Sejarah Bangsa | 680 |  | √ | √ | √ | √ | √ | √ |  | √ | √ |
| Dinamika dan Tantangan Pancasila sebagai Dasar Negara | 680 |  | √ | √ | √ | √ | √ | √ |  | √ | √ |
| Pancasila sebagai Ideologi Negara | 680 |  | √ | √ | √ | √ | √ | √ |  | √ | √ |

## Peta Bidang Kajian

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **NO** | **WARNA** | **Bidang Kajian  (Field Of Study)** | **TIMES REQUIREMENT** | | **CREDIT** | **%** |
| **Minutes** | **Hour** |
| 1 |  | Automotive Equipment & Measurement Tools | 5440 | 91 | 2 | 2% |
| 2 |  | Engine Group | 38080 | 635 | 14 | 13% |
| 3 |  | Electrical & Accessories Group | 27200 | 453 | 10 | 9% |
| 4 |  | Chassis & Drivetrain Group | 16320 | 272 | 6 | 5% |
| 5 |  | Vehicle Testing & Automotive Regulation | 5440 | 91 | 2 | 2% |
| 6 |  | Science & Mathematics | 54400 | 907 | 20 | 18% |
| 7 |  | Engineering Support | 16320 | 272 | 6 | 5% |
| 8 |  | Management & Entrepreneurship | 21760 | 363 | 8 | 7% |
| 9 |  | Advanced Vehicle Technology | 21760 | 363 | 8 | 7% |
| 10 |  | National Mandatory Courses & University Values | 92480 | 1541 | 34 | 31% |
|  | **TOTAL** | | **299200** | **4987** | **110** | **100%** |

## Distribusi Bidang Kajian Kedalam Mata Kuliah

| **NO** | **WARNA** | **BIDANG** | **LIST MATA KULIAH** | **SKS** | **TOTAL** |
| --- | --- | --- | --- | --- | --- |
| 1 |  | AUTOMOTIVE EQUIPMENT & MEASUREMENT TOOLS | AUTOMOTIVE EQUIPMENT & MEASUREMENT TOOLS | 2 | 2 |
| 2 |  | ENGINE GROUP | ENGINE MECHANICAL | 4 | 14 |
| ENGINE SUPPORTING SYSTEM | 4 |
| GASOLINE ENGINE MANAGEMENT SYSTEM | 4 |
| DIESEL ENGINE MANAGEMENT SYSTEM | 2 |
| 3 |  | ELECTRICAL & ACCESSORIES GROUP | LIGHTING & INSTRUMENTATION | 4 | 10 |
| AC & HEATER SYSTEM | 4 |
| ACCESSORIES & SAFETY SYSTEM | 2 |
| 4 |  | CHASSIS & DRIVETRAIN GROUP | CHASSIS & BODY MECHANICAL | 4 | 6 |
| DRIVE TRAIN MECHANICAL | 2 |
| 5 |  | VEHICLE TESTING & AUTOMOTIVE REGULATION | ENGINE & VEHICLE TESTING | 2 | 4 |
| AUTOMOTIVE STANDARD & REGULATION | 2 |
| 6 |  | SCIENCE & MATHEMATICS | AUTOMOTIVE MATHEMATICS | 2 | 18 |
| AUTOMOTIVE MECHANICS | 2 |
| VEHICLE DYNAMICS | 2 |
| HEAT TRANSFER | 2 |
| THERMODYNAMICS | 2 |
| FLUID MECHANICS | 2 |
| AUTOMOTIVE MATERIALS | 2 |
| BASIC ELECTRIC & ELECTRONIC | 4 |
| 7 |  | ENGINEERING SUPPORT | COMPUTER APPLICATION | 2 | 8 |
| TECHNICAL DRAWING | 2 |
| ENGLISH FOR ENGINEERING | 2 |
| ENGLISH FOR COMMUNICATION | 2 |
| 8 |  | MANAGEMENT & ENTREPRENEURSHIP | INNOVATION & ENTERPRENEUR | 2 | 6 |
| WORKSHOP MANAGEMENT | 2 |
| PROFESSIONAL ETHICS | 2 |
| 9 |  | ADVANCED VEHICLE TECHNOLOGY | ALTERNATIVE FUEL | 2 | 8 |
| ADVANCE VEHICLE TECHNOLOGY | 2 |
| AUTOMOTIVE MECHATRONICS | 4 |
| 10 |  | NATIONAL MANDATORY COURSES & UNIVERSITY VALUES | AL ISLAM & KEMUHAMMADIYAHAN 1 | 2 | 34 |
| AL ISLAM & KEMUHAMMADIYAHAN 2 | 2 |
| AL ISLAM & KEMUHAMMADIYAHAN 3 | 2 |
| AL ISLAM & KEMUHAMMADIYAHAN 4 | 2 |
| PANCASILA | 2 |
| KEWARGANEGARAAN | 2 |
| BAHASA INDONESIA : TATA TULIS ILMIAH | 2 |
| ON THE JOB TRAINING (OJT) | 12 |
| FINAL PROJECT | 8 |
| **JUMLAH** | | |  | **110** | **110** |

## Matrik Mata Kuliah terhadap Bahan Kajian

| **Nama Mata Kuliah** | **Bahan Kajian** |
| --- | --- |
| 1. Automotive Equipment & Measurement Tools | Product Knowledge & Automotive equipment |
| Service data and form |
| Automotive metrology |
| Automotive measurement tools |
| 1. Engine Mechanical | Engine geometry |
| Piston and crank |
| Valve mechanism |
| Fly wheel |
| 1. Engine Supporting System | Fuel supply system |
| Cooling system |
| Lubricating system |
| Ignition system |
| Charging system |
| Start up system |
| 1. Gasoline Engine Management System | Bsic Gasoline EMS |
| Gasoline Engine & Vehicle sensors |
| Gasoline Engine & Vehicle actuators |
| Gasoline ECU process & Wiring systems |
| 1. Diesel Engine Management System | Diesel EMS |
| Diesel Engine & Vehicle sensors |
| Diesel Engine & Vehicle actuators |
| Diesel ECU process & wiring systems |
| 1. Lighting & Instrumentation | Electrical symbols and wiring diagrams |
| Auto-Lighting |
| Wiper & Washer |
| 1. AC & Heater System | Heater & Ventilation System |
| Air Conditioning system |
| 1. Accessories & Safety System | Audio & Video |
| Electric Mirror |
| Power Windows |
| Central lock |
| Air Bag |
| Immobilizer system |
| 1. Chassis & Body Mechanical | Steering system |
| Brake system |
| Suspension system |
| Wheel Alignment |
| 1. Drive Train Mechanical | Automatic transmission |
| Drivetrain mechanism |
| 1. Engine & Vehicle Testing | Engine performance |
| Engine testing |
| Vehicle testing |
| 1. Automotive Materials | Material properties |
| Material for Automotive parts |
| Material process for automotive parts |
| 1. Fluid Mechanics | Fluid properties |
| Fluid statics |
| Fluid dynamics |
| 1. Basic Electric & Electronic | Basic electrics |
| Basic electronics |
| 1. Automotive Standard & Regulation | Automotive industry standard & regulation |
| Vehicle dimension standard & regulation |
| Vehicle equipment regulation |
| Emission regulation |
| Transportion regulation |
| 1. Automotive Mathematics | Algorithm for control |
| Algebra & Graph |
| Geometry & trigonometry |
| Motion, speed, & acceleration |
| 1. Automotive Mechanics | Newton's Law |
| Stress in Auto-Parts |
| Torsional & Bending Stresses in Auto-parts |
| Variable stress in Auto-parts |
| Joint in Auto-part |
| Key & Coupling |
| Gear, belt, chain, & pully |
| 1. Vehicle Dynamics | Vehicle dynamics |
| Vibration |
| Balancing |
| 1. Heat Transfer | Mass transfer |
| Model of heat transfer |
| Concept of heat transfer coeficien |
| 1. Thermodynamics | Thermodynamics law and properties |
| Energy equilibrium |
| Reversible and irreversible system |
| Thermodynamics fluids |
| Combustion process and energy delivery |
| Emission analysis |
| 1. Computer Application | Data Processing & displaying |
| Data & Graph Analysis |
| Computer application for scientific writing |
| Computer application for statistics |
| Computer application for simulation |
| 1. Technical Drawing | Drawing instruments, equipment & materials |
| Graphical communication |
| Construction of simple geometrical figures & shapes |
| Isometric and oblique projections |
| Single orthographic projections |
| 1. English For Engineering | Engineering for engineering |
| 1. English For Communication | English for communication |
| 1. Innovation & Enterpreneur | Bussines Opportunity & Challange |
| Vision building |
| Leadership |
| Innovation management |
| Cost analysis |
| Bussines plan |
| 1. Workshop Management | Resource management |
| Safety management |
| Workshop facility management |
| Part & Waste Management |
| Customer Service Satisfied |
| Mechanic Qualification Frame Work |
| 1. Professional Ethics | SOP of services |
| Responsibilities of automotive technicians |
| Code ethics of engineer & technician |
| Code ethics of automotive instructor |
| Code ethics of enterpreneur |
| 1. Alternative Fuel | Natural gas vehicles |
| LPG Vehicles |
| Biofuels |
| Exhaust gas reduction |
| 1. Automotive Mechatronics | Signal, Actuator, & wiring |
| Control systems |
| Microcontroller |
| Data acquisition |
| Embeded Systems |
| 1. Advance Vehicle Technology | Engine performance enhancement |
| Low emissions vehicles (LEVs) |
| Ultra-low emission vehicles (ULEVs) |
| Smart Vehicles |
| Zero Emission Vehicles |
| Hydrogen cycles |
| 1. Pancasila | Konsep dan Urgensi Pendidikan Pancasila |
| Sumber Historis, Sosiologis, Politik Pend. Pancasila |
| Konsep dan Urgensi Pancasila dalam Arus Sejarah Bangsa |
| Dinamika dan Tantangan Pancasila sebagai Dasar Negara |
| Pancasila sebagai Ideologi Negara |
| Pancasila sebagai Sistem Filsafat |
| Konsep dan Urgensi Pancasila sebagai Sistem Etika |
| Pancasila sebagai Dasar Nilai Pengembangan Ilmu |
| 1. Kewarganegaraan | Konsep dan Urgensi Pendidikan Kewarganegaraan dalam  Pencerdasan Kehidupan Bangsa |
| Konsep dan Urgensi Identitas dan Integrasi nasional |
| Konsep dan Urgensi Konstitusi dalam Kehidupan Berbangsa- Negara |
| Konsep dan Urgensi Harmoni Kewajiban dan Hak Negara dan  Warga Negara |
| Konsep dan Urgensi Demokrasi yang Bersumber dari Pancasila |
| Konsep dan Urgensi Penegakan Hukum yang Berkeadilan |
| Konsep dan Urgensi Wawawan Nusantara |
| Konsep dan Urgensi Ketahanan Nasional dan Bela Negara |
| 1. Bahasa Indonesia | Tata tulis ilmiah |
| 1. AIK 1 | Kemanusiaan dan keimanan |
| 1. AIK 2 | Ibadah, akhlak dan muamalah |
| 1. AIK 3 | Kemuhammadiyahan |
| 1. AIK 4 | Islam dan Ilmu Pengetahuan |
| 1. On the Job Training | On the Job Training |
| 1. Final Project | Final Project |

## Distribusi Mata Kuliah

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **SEMESTER 1** | | | |  |
| **NO** | **KODE** | | **NAMA MATA KULIAH** | **SKS** |
|
|  |  | | AUTOMOTIVE EQUIPMENT & MEASUREMENT TOOLS | 2 |
|  |  | | ENGINE MECHANICAL | 4 |
|  |  | | BASIC ELECTRIC & ELECTRONIC | 4 |
|  |  | | AUTOMOTIVE MATERIALS | 2 |
|  |  | | AUTOMOTIVE MATHEMATICS | 2 |
|  |  | | THERMODYNAMICS | 2 |
|  |  | | ENGLISH FOR ENGINEERING | 2 |
|  |  | | PANCASILA | 2 |
|  |  | | AL ISLAM & KEMUHAMMADIYAHAN 1 | 2 |
|  |  | | **JUMLAH** | **22** |
|  | | |  |  |
| **SEMESTER 2** | | | |  |
| **NO** | | **KODE** | **NAMA MATA KULIAH** | **SKS** |
|  | |  | ENGINE SUPPORTING SYSTEM | 4 |
|  | |  | LIGHTING & INSTRUMENTATION | 4 |
|  | |  | DRIVE TRAIN MECHANICAL | 2 |
|  | |  | CHASSIS & BODY MECHANICAL | 4 |
|  | |  | AL ISLAM & KEMUHAMMADIYAHAN 2 | 2 |
|  | |  | ENGLISH FOR COMMUNICATION | 2 |
|  | |  | AUTOMOTIVE MECHANICS | 2 |
|  | |  | HEAT TRANSFER  **PENGKODEAN DISESUAIKAN DENGAN SURAT EDARAN TERBARU WR 1 TENTANG PENGKODEAN MATA KULIAH DI KPT** | 2 |
|  | |  | **JUMLAH** | **22** |

|  |  |  |  |
| --- | --- | --- | --- |
|  | **SEMESTER 3** | |  |
| **NO** | **KODE** | **NAMA MATA KULIAH** | **SKS** |
|  |  | AC & HEATER SYSTEM | 4 |
|  |  | GASOLINE ENGINE MANAGEMENT SYSTEM | 4 |
|  |  | AUTOMOTIVE STANDARD & REGULATION | 2 |
|  |  | ALTERNATIVE FUEL | 2 |
|  |  | VEHICLE DYNAMICS | 2 |
|  |  | WORKSHOP MANAGEMENT | 2 |
|  |  | FLUID MECHANICS | 2 |
|  |  | AL ISLAM & KEMUHAMMADIYAHAN 3 | 2 |
|  |  | BAHASA INDONESIA : TATA TULIS ILMIAH | 2 |
|  |  | **JUMLAH** | **22** |
|  |  |  |  |
|  |  |  |  |
|  | **SEMESTER 4** | |  |
| **NO** | **KODE** | **NAMA MATA KULIAH** | **SKS** |
|  |  | DIESEL ENGINE MANAGEMENT SYSTEM | 2 |
|  |  | ACCESSORIES & SAFETY SYSTEM | 2 |
|  |  | ENGINE & VEHICLE TESTING | 2 |
|  |  | COMPUTER APPLICATION | 2 |
|  |  | AUTOMOTIVE MECHATRONICS | 4 |
|  |  | INNOVATION & ENTERPRENEUR | 2 |
|  |  | KEWARGANEGARAAN | 2 |
|  |  | AL ISLAM & KEMUHAMMADIYAHAN 4 | 2 |
|  |  | ADVANCE VEHICLE TECHNOLOGY | 2 |
|  |  | TECHNICAL DRAWING | 2 |
|  |  | **JUMLAH** | **22** |
|  |  |  |  |

|  |  |  |  |
| --- | --- | --- | --- |
|  | **SEMESTER 5** | |  |
| **NO** | **KODE** | **NAMA MATA KULIAH** | **SKS** |
|  |  | Professional Ethics | 2 |
|  |  | On The Job Training (OJT) | 12 |
|  |  | **JUMLAH** | **14** |
|  |  |  |  |
|  | **SEMESTER 6** | |  |
| **NO** | **KODE** | **NAMA MATA KULIAH** | **SKS** |
|  |  | Final Project | 8 |
|  |  | **JUMLAH** | **8** |

# PENUTUP

Sesuai dengan Permenristekdikti No: 44 tahun 2015, kurikulum merupakan serangkaian perencanaan kegiatan pembelajaran untuk mencapai Capaian Pembelajaran Lulusan (CPL). Dokumen kurikulum ini diharapkan menjadi pedoman dalam penyusunan Rancangan Mutu Pembelajaran (RMP) pada setiap mata kuliah. Metode pembelajaran yang diterapkan harus memperhatikan pada bahan kajian, capaian pembelajaran mata kuliah dan capaian pembelajaran lulusan yang didukung. Semoga dokumen kurikulum ini dapat dijadikan pedoman bagi seluruh civitas akademik dalam upaya untuk mewujudkan visi program studi.

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11. ~~Automotive Curriculum Framework, Board of Studies, Teaching and Educational Standards NSW, 2014~~
12. ~~Diploma Curriculum of Engineering Technology in Automotive Maintenance, University Kuala Lumpur,~~ [~~http://www.unikl.edu.my/web/unikl-mfi/prog-offered-automotive-engineering/~~](http://www.unikl.edu.my/web/unikl-mfi/prog-offered-automotive-engineering/)
13. ~~Course Details Bachelor of Technology (Hons) in Automotive,~~[~~Infrastructure University Kuala Lumpur (IUKL)~~](https://studymalaysia.com/where/profile.php?code=IUKL)~~,~~ [~~https://studymalaysia.com/what/course/IUKL/0005885~~](https://studymalaysia.com/what/course/IUKL/0005885)
14. ~~Diploma In Automotive Engineering Technology, Despark College,~~ [~~http://www.desparkauto.edu.my/~~](http://www.desparkauto.edu.my/)

# Lampiran

## Diskripsi Mata Kuliah

Tuliskna seluruh mata kuliah di kurikulum ini

|  |  |  |  |
| --- | --- | --- | --- |
| Nama Mata Kuliah | : |  | |
| Kode Mata Kuliah | : |  | |
| Diskripsi Mata Kuliah | : |  | |
| CPL yang dituju | : | S.01  KU.01  KK.03  P.03  dst |  |
| CP MK yang dituju |  | M 1  M 2  M 3  M 4  dst |  |
| Kualifikasi Keahlian Dosen |  | | |
| Sarana Prasarana yang diperlukan |  | | |

## Tabel Konversi Matakuliah

## Dokumen lain yang dinilai perlu

1. Buku Panduan Penyusunan Kurikulum Pendidikan Tinggi, Direktorat Pembelajaran Kemenristekdikti, 2016 [↑](#footnote-ref-1)