Nr.crt.	Title	Description	Technical knowledge required	Tests	Nr. Stud
1	SAP HR Implementation	Implementation of the SAP HR module for all Conti RO locations. Organizational Management, Personnel Administration, Time Management, Payroll, ESS/MSS activities. Full cycle project. All technical and functional activities.	data bases, technical documentation creation, MS project, elearning tools, sharepoint (end user)	IT	1
2	Central Display	- the purpose of the project is to design and model a color central display with touch capabilities - from mechanic point of view the display is composed of a LCD display, touch screen, PCB assembly, frame and rear cover - the learned abilities will consist in different constructive solutions to overcome challenges specific for the field of display design - gain or improve knowledge of parametric modeling with hierarchical structure - students will get knowledge in the field of automotive LCD's, touch panels and displays	Mechanics: basic knowledge of mechanical design, MCAD (ProE/Creo or Catia V5)	MD	1
3	CAN & FlexRay automated tests	Tools: specific textboxes, bus monitoring tool. Daily tasks: Requirements understanding, test cases definition, test cases verification, reports. Testcase definition for CAN, FlexRay communication standard CAPL programming, CANoe usage A mentor will support you to stepwise take over own responsibility after an initial training phase which will familiarize you with our products, tools, processes and organization.	Basic C programming language knowledge, basic knowledge of embedded systems and about microcontrollers	ANSI C, microcontrollers	2

Nr.crt.	Title	Description	Technical knowledge required	Tests	Nr. Stud
4	Method of testing the communication interfaces of an Airbag Control Unit	The Airbag Control Unit (ACU) has a well-known role in saving lives. It is always a challenge to prove that the product we are delivering to our customers is robust and can work efficiently during its lifetime. Nowadays active and passive safety systems are networked; this leads to an increase complexity of communication channels, functions and variants. Here arise the potential of improving actual test methods and strategies and to examine new ones and implement them in actual processes.	The candidate we are looking for should have good engineering skills, able to quickly learn and adapt to new technologies and challenges	ANSI C, microcontrollers,	1
5	Auto Code Generation ACG from Matlab Simulink models for customer projects	We receive from customer models in Matlab Simulink format. We need to generate code out of these models and tests. In order to reach that we need to follow several steps: - generate test vectors using Reactis from customer models - import customer models and modify in SDA format (Continental specific Matlab library) - generate specifications - auto code generation, review generated code, solve error/warning messages - import test vectors and run test cases in floating point, fixed point, software in the loop (SIL) and on the target with microcontroller (PIL), analyze test results - document, save results in a MKS workspace	Systems Theory: good Systems Identification: good Numerical Control Systems: good Signal Processing: good Programming ANSI 'C': good	ANSI C, Matlab.	2

Nr.crt.	Title	Description	Technical knowledge required	Tests	Nr. Stud
6	CAN network simulator	This project is related to an Engine Control Unit. - Create a program that is able to simulate transmission of messages on CAN network , at specified recurrence - It is able to read CAN messages that are coming on CAN bus - Use an existing programmable hardware that is able to receive/ transmit CAN messages, which offers an API to be used by the simulator	ANSI C, C# and Java Numerical Control Systems: good Signal Processing: good Programming ANSI C: good	ANSI C, Java	1
7	EEPROM analyzer	This project is related to an Engine Control Unit. The program will receive as input: - an XML with mapping of the customer project EEPROM device - read the dump file from the EEPROM of the Engine Control Unit - read additional configuration (like start address of the EEPROM data) from a config file Then the program have to generate a report (configurable) in format XLS or HTML with following content: - associate to every block described in XML the corresponding values from the dump (detect areas in dump and then display in different formats: hex, decimal or ASCII); - calculate the checksum and check with value from the dump	ANSI C, C# or Python or Java Numerical Control Systems: good Signal Processing: good Programming ANSI C: good	C# , Python, Java	1

Nr.crt.	Title	Description	Technical knowledge required	Tests	Nr. Stud
8	Specification and code analyzer	This project is related to an Engine Control Unit. - Create a program that parses the word specification and the code. - A code interpreter must be developed , in order to extract information from the c code files. - It extracts information from specification and from code in two different columns and you can see which variable is missing from any of the sides. - A PDF parser must be developed also to check the documents that are converted to PDF - Word automation is also required - The program can be extended to check if data in output/input tables is used inside the formula section for all types of specification	ANSI C, C# or Java Numerical Control Systems: good	C# or Java	1
9	Establish a reporting template for daily reaction meeting	Establishing an easy way to report on a daily basis all relevant Quality KPIs in order to have a better overview and a faster reaction time.	Quality	not required	1
10	Tooling and gauge design	Perform CAD design and drawings for tooling and gauge needed for prototype sample build.	CAD kwnoledge	MD	1
11	Plastic parts design optimization within ECU MPA	The main goal is to optimize the design flow of plastic parts from the products developed in ECU MPA (engine control units , selective catalytic reduction , etc.) Using mold flow as simulation tool for designed plastic part will be in focus. As deliverable a guide for how to design a plastic part and what are the major check points should be ready at the end of the summer practice.	Injection molding of plastic knowledge would be an advantage	MD	1

Nr.crt.	Title	Description	Technical knowledge required	Tests	Nr. Stud
12	SPEED 4.0 FEA tests	Tools: LeCroy oscilloscopes, Test templates, PC Diag Daily tasks: - Understanding of the requirements and the description of the FEA destructive tests - Understanding of the ASICs requirements - Support in the testing setups - Support in ASICs FEA testing After an initial training phase which will familiarize you with our products, tools, processes and organization, a mentor will support you in taking over of the responsibility for the FEA testing.	Basic electronic devices and circuits, basic knowledge of embedded systems and microcontrollers	HW, microcontrollers	1
13	BG744	HVAC controller for Bugatti. Requirements analysis Test Case creation Help colleague to automate and execute tests SW installation on devices. Check traceability (Requirements – Test Case)	General electronics knowledge	ANSI C	2
14	Implement some applications in Visual Studio 2013 and Java plugins	1.There is one application used to make some manipulation of Motorola type files. We would like to be migrated to a newer Visual Studio version, e.g. 2013 2. There is one application which analyze project's data by using DOM(data object Model). Several plugins are needed to translate information from different file formats to internal DOM data type or to create Excel reports	Java plugins, DOM/XML	C++, Java	1
15	Module SW development for embedded transmission system	Learning the process and performing an industrial SW for automotive products. Requirements analysis, design concept, coding in C language and integration in a complete project	Good knowledge of microcontrollers and understanding of programming principles	ANSI C, microcontrollers	1

Nr.crt.	Title	Description	Technical knowledge required	Tests	Nr. Stud
16	Position/speed control algorithm for sensor based BLDC motor	The algorithm should be able to control motor position while following a speed profile. The speed and position may be controlled independently (if only one is required). All parameters should be able to be calibrated	Good knowledge of microcontrollers and understanding of programming principles	ANSI C, microcontrollers	1
17	Project configuration tool	Project consist in developing an interface tool for generation of project specific component. Environment is based on Java specific language.	ANSI C JAVA	ANSI C, Java	1
18	VW Requirements script to process notification emails	The document for the requirements of these project has been developed according to the IEEE Standard and combines the requests coming from customers (German: Lastenheft) with the resulting requirements being developed out of these requests (German: Pflichtenheft). The requests from customer describe “what is to be done?” and “what for?”. The resulting requirements being developed by IT describe how and with what the requests will be fulfilled. The end result would provide an efficient way to perform the audit for VW that it is done day by day. The scope :	Programming	C#	1

Nr.crt.	Title	Description	Technical knowledge required	Tests	Nr. Stud
19	Harmonization of Electronic Library for Manufacturing (Zuken CR5000)	The library of the electronic components needs to ensure that specific R&D design could manufactured in CEP plants. Therefore, investigations to improve the component library creation, customization and maintenance need to be performed. Basically, the activities proposed to run this project would consist of: • Learning the process and methodology to create Zuken CR5000 components in the Conti Library; • Become familiar with the manufacturing technologies' of electronic components • Support the users in the BU to integrate the created parts into their innovative designs	Fundamentals of electronics (or mechanics); Library parts creation in any of EDA or Mechanical tools (Orcad, Eagle, Zuken, Ansys, Catia….) Understanding of electronics technology	HW, MD, microcontrollers	2
20	Structural Simulations Results Library	An excel based library that contains results from multiple structural simulations need to improved by adding more results. These results mostly reflects spring geometries, made out of plastic or metal, in static conditions. The 3D geometries must be first created in Catia as a parametric model, then imported into Ansys, where, with help of a plug-in called Optislang, consecutive simulations will be made automatically, in order to obtain many results in less time.	Material Strenght(Advanced), Catia (Intermediate), Excel VBA (Intermediate), Ansys (Basic)	MD	1

Nr.crt.	Title	Description	Technical knowledge required	Tests	Nr. Stud
21	State Machine Simulator	Each project has internal state machine. The state machines become more and more complex and The events/ triggers around them increase a lot complexity A lot of times investigations are getting too complex and a simulation environment is needed It's much easier to create system scenarios on PC Also, better understanding of The system behavior can be achieved using PC simulation Visual understanding of system behavior can be used Also in client presentations	C++, UML, Rhapsody (is a plus)	C++	1
22	Automated module testing	Integrate Cantata in Jenkins Canatata is used environment for module testing. Cantata tests are done manually Jenkins is automation server By uploading Cantata tests to Jenkins, any later code modification will be shown by module tests reports automatically and Cantata team can update tests/ test environment	C, C++, scripting, servers	ANSI C, C++, IT	1
23	NvM Simulator for FEE systems	Integrate NvM Autosar stack in a PC tool application The NvM state machine shall run similar to embedded systems (cyclic call of main function) The FEE banks shall be emulated in the PC RAM The PC application shall provide means of scheduling calls for the NvM APIs to simulate a call sequence from an embedded system The PC application shall provide means to visualize the layout of NvM banks and also trace the operations on NvM blocks (e.g read, write, swapping)	C and Visual C++ (or similar)	ANSI C, microcontrollers, C++/ C#/ Java, IT	2

Nr.crt.	Title	Description	Technical knowledge required	Tests	Nr. Stud
24	PPAR interpreter	When ECUs are build up, PPAR (Production Parameters) are flashed on ECU in *.mot format PPAR represent specific parameters for each ECU. PPAR layout is specified and the values are determined mostly in production site During PPAR investigations, *.mot file is received from production site. An interpreter of this *.mot file is missing, in order to speed up investigations Also, different values from PPAR need to be modified and *.mot re-created in order to perform all kind of scenarios Application connection with Excel is needed	scripting, Java/ Visual Basic (or similar)	Java/ C#/ C++	1
25	Image Acquisition Satellite for 3 dimensional images (Stereo Images) for a remote processing unit	The ADAS HW team is developing sensors for implementing advanced sensing functions for the future Autonomous Driving vehicle. An important sensor for ADAS functions is the Stereo Camera. There are many functions based on image processing implemented with mono cameras. Stereo Cameras, in comparison with mono cameras, provide the possibility to measure with precision the distances to any object that can be recognized in the captured images. This advantage makes the Stereo Cameras a perfect fit device for the family of sensors planned to be used in the future Autonomous Vehicles. In this project we investigate the possibility to develop a stereo camera in a 2 box design architecture. One box will consist of the image acquisition unit that is located on the vehicle windshield. This part must to grab periodically 2 synchronized images, from 2 CMOS Camera Sensors which are configured dynamically by a processor which located in the second box, the processing box. The captured images have to be transferred without resolution lost from the image acquisition box to the processing unit. The theme of the project addresses the image acquisition box that we called the Image Acquisition Satellite for 3 dimensional images.	Analog and digital electronic	HW	3

Nr.crt.	Title	Description	Technical knowledge required	Tests	Nr. Stud
26	Material Behavior Study	Get to know the products from ADAS, the materials that have being used for different products. Study the materials that are agreed by Continental from mechanical point of view, and also materials that are not agreed by Continental but available on the Market, with focus on materials that are used in Sheet Metal , Die Cast, and Injection Molding . Compare the materials in a document, and present the advantages and disadvantages of those materials.	Mechanical Properties of Materials and their behavior in different circumstances	MD	1
27	QAC execution from TD4 on a specific file	In order to assure the quality of the modules developed in Timisoara, every developer has to perform Static Analysis on the modified source code and fix any errors that might appear. The tool used at the moment to perform this task is QAC. Configuration and running QAC to identify possible errors in the code is not an easy task. The tool requires several steps to be done by the developer in order to check the code. Because of this, a lot of developer neglect to perform Static Analysis on the modified code. The goal of the project is to find a way to configure in an ongoing project QAC in such a way, that a developer could easily execute it from TD4 which is an Integrated Development Environment based on Eclipse used for development. This way every developer can run QAC after every code modification and fix the errors and warnings reported by the tool.	Scripting, Makefile, C, Eclipse, QAC	ANSI C	1

Nr.crt.	Title	Description	Technical knowledge required	Tests	Nr. Stud
28	TRACE32 Script Generator	Task: - creating TRACE32 scripts for Lauterbach debuggers; the scripts are intended to automate certain white-box (integration) tests - creating a generator (and/or templates) for the above mentioned scripts These automated scripts can help developers and integrators to run much more tests after every nightly build.	Python (preferred), C, Microcontrollers/Embedded hardware, scripting language(s)	ANSI C, microcontrollers, C++ or Java	1
29	Create CANoe simulations for VW – Porsche projects	Vector CANoe tool is used in Automotive industry to simulate Electronic Control Units connected via communication buses (CAN, LIN...) or to trace and decode the communication between real Electronic Control Units. It has its own very interactive programming language, based on C, which is called CAPL (CAN Access Programming Language). It also has a graphical interface for creating Panels (user-configurable graphical interfaces). The visual objects are linked to Automotive specific signals and, based on the triggers provided by the car system or by the simulation mechanisms, could offer different visualizations as the output of the simulation process. First step is an introduction stage based on studying and understanding existing Vector CANoe simulations. Previous knowledge or experience with Vector tools is not mandatory, support will be offered by VW-Porsche Software Engineers from Continental Automotive. After the introduction stage you will be able to update existing simulations and/or create new simulations based on the requirements received from the project team. The outcome of this work will be: - basic understanding of automotive architectures and	C programming; basic knowledge of CPU-memory flow of information (transformations from hex to binary, role of RAM, memory types). HW basics (digital vs analog signals), equipments (multi-meter, oscilloscope) and procedures for reading these signals. Visual C++ knowledge is a plus. basic OOP knowledge is a plus.	ANSI C, microcontrollers	1

Nr.crt.	Title	Description	Technical knowledge required	Tests	Nr. Stud
30	Car diagnostic data processor	The different ECUs of the car are communicating between them. In order to find out if they are within working parameters or debug a problem the diagnostic tool was build. It can read a lot of data from your car. You would get a chance to interact with a diagnostic tool, see how it checks for data and work on a tool that transforms that data. The tool would have to work with a database, get information from it and transform it into a format that can be displayed. The tool would be built using object oriented programming and having a graphical interface.	Basic understating of databases OOP: C# or Java or C++	C#	1
31	Diagnosis over CAN library	Implementation of ISO Diagnosis over CAN in a C# library (dll). With this project you get a chance to interact with: - Visual Studio - OOP programming (C#) - CAN protocol - Version Control Management - Tachograph diagnostic services This tool will be used within the Tachograph group that develops and tests the software that runs on DTCO devices.	OOP: C# or Java or C++	C#	1

Nr.crt.	Title	Description	Technical knowledge required	Tests	Nr. Stud
	Diagnostic Autodetect simulator	Work with a diagnostic tool – the device that connects to car and can receive parameters from various ECUs present in the car. You can see Live data changing, get to know if there are any issues with the engine, various sensors and so on. Based on specific parameters each type of car has you can have the device identify the type of car, it's manufacturing information like series and other data. The project would be a tool that simulates the auto detect done by the diagnostic tool. Based on a database which contains several types of cars and their specification it , would be then a simulator file created that can be loaded on the OEM simulator. This project would have a user interface where the data loaded from the DB can be seen and changed if needed.	OOP: C# or Java or C++ Basic understating of databases	C#	1
33	Develop a SW Emulator for Linux Embedded Automotive Platform applications	Our main embedded SW applications are developed in a Linux environment and are deployed on mobile devices (Linux OS + Continental SW platform). There is a strong dependency on the HW, even during the first phases of development. In order to reduce this dependency, a SW emulator that will mimic the actual behavior of the HW will be developed. The emulator will be purely software, will be implemented using OOP C++ and should be able to run in both Windows and Linux runtime environments.	OOP, C++	C++, JAVA	1

Nr.crt.	Title	Description	Technical knowledge required	Tests	Nr. Stud
34	SW system test for the display cluster (display, pointers, tell tales)	The existing test specifications are created according to the customer requirements. They reflect different use cases in which the correct behavior is checked. Having a test bench made out of SW tools and HW equipments a real car is simulated. The tester will have to test in simulated mode the newest prototype products for well known car manufacturers. For example if you simulate that the tank lid is open, the expected result is that a warning for the driver appears. The tests are performed for the following customers: - Mercedes - VW - Ford - FIAT - BMW	Basic electronics Basic car knowledge Basic programming knowledge Good Microsoft Office knowledge	ANSI C, microcontrollers, HW	13
35	Mechanical design engineering support	CAD modeling of various plastic housings including assembly of such housings. Running different engineering tests designated to reproduce some product failures (e.g. drop tests, over pressure test, force measurements, ...) Designing specific test fixtures (3D + 2D)	Catia CAD design – 3D + 2D Tolerance calculation Materials (plastics, metals)	MD	1
36	Code review tool	Inside our team we have used a code collaborator tool, from an external company. The code collaborator provides a “virtual” environment for performing code reviews. Based on this experience we can take what has been useful for us and create an internal tool for our usage. We will no longer spend money on licence and we can also configure the tool according to our needs.	Microsoft Visual C# language Java	ANSI C, C#, Java	2

Nr.crt.	Title	Description	Technical knowledge required	Tests	Nr. Stud
37	Configurable project environment demonstrator	The idea behind this project is to create a configurable setup for building a SW project from beginning (OS setup) up to the end (SW components and interactions). The user interface will allow our customers to dynamically configure the functions of their ECUs according to their needs (e.g. add/remove functions /sub-function in real time and re-build and load the SW on the target ECU). The idea can be extended to the vehicle as a whole system (we may derive a distinct project for this), were the customers can add/ remove nodes (e.g. ABS, TPMS, HFM) in real time and import part of the SW to remaining ones (e.g. if we remove HFM ECU the BCM will have to compensate and option to add HFM functions to it will be available automatically). For development of the application (user interaction for environment configuration) Microsoft Visual C# language shall be used.	OOP knowledge: - Microsoft Visual C# language - Java - PHP, Java Scripts (to import the application online) Design patterns	ANSI C, microcontrollers, C#, Java	2
38	Implement tool to Convert quality matrix in SW Dashboad Format	Quality matrix is an automatically generated excel sheet containing all quality information relevant to a project. It focuses on quality of the deliverable (objects) inside one project. I.e. we have code file .c and we have the associated quality, meaning a review document and consequently an update of the affected code file. Now this quality report has to be converted in a different/standardized world-wide I BS format. The job of the student will be to implemented VBA / Visual C++ or V# the application which can perform such conversion.	Advanced VBA, C++, C# Experice with Office Excel 2007 Basic HW knowledge	C++, C#	

Nr.crt.	Title	Description	Technical knowledge required	Tests	Nr. Stud
39	QR code Quest	Development of an software applications QR code spread on site during different events like Conti Show Off (Quest game). Generate different statistics based on scanned QR Codes & Other applications that can be derived from the subject QR Code.	Programming/ Android	ANSI C, microcontrollers	1
40	Automatic Project Status(Jyra) Displayed on TV/Phone	Software applications development which will collect several ongoing projects status and place it on a TV / Projector. The application shall be able to upload this status in the cloud so it can be safe access by multiple users. Project status shall be available on your mobile phone for all project members.	Programming/ Android	ANSI C, microcontrollers	1
41	SW Integration Test Automatization	Through automated test environment provided by C1A HFM project a student can learn about BCM functional behavior throught SW integration tests automatized using CAN/Capl test scripts.	Advanced ANSI C knowledge. Equivalent: C++ or C#. Basic knowledge of communication networks concepts (CAN/LIN protocol) Basic HW knowledge	ANSI C, C++, C#	
42	Research and test effects of newly installed applications on overall PC functionally	To investigate: • why the corrupted registry entries make application unable to run: [HKEY_LOCAL_MACHINE\SOFTWARE\Classes\pl_file\shell\open\command] @="\"C:\\LegacyApp\\perl\\bin\\perl.exe\" \"%1\" %*" • why profile deletion is necessary in some cases to make applications work • document which additional applications need to be installed to be able to compile customer project • why java installation needs to be fixed by support people (path variable configuration, uninstall old versions). Provide an automatic solution	good knowledge of scripting languages (bash), good knowledge of Windows Operating system (Registry, environment)	Java	1

Nr.crt.	Title	Description	Technical knowledge required	Tests	Nr. Stud
43	Automation for the frequency spectrum evaluation	An application in C# is required for the NF-5035 spectrum analyzer in order to read the data in automated tests.		C#	1
44	Flashloader for a RL78/D1A based microcontroller	Create a flashloader for a RL78/D1A microcontroller (LCP platform) Main features: 1. Communication on UDS on CAN protocol 2. Erase memory blocks based on start address and size received via CAN bus from a tester. 3. Program data received via CAN bus from a tester to the flash memory. 4. Verify the integrity of the programmed data using a CRC check. 5. Optimizations of the code in order to occupy as less flash and possible	C programming language microcontrollers flash memory chips basic electronics knowledge CAN bus protocol.	ANSI C, microcontrollers, C++	1
45	eHorizon Automated Tester Application	Aim of the project is to develop an application to enable fast CAN and Diagnosis automated integration testing on the eHorizon project. Developed application will to be easily configurable and flexible, as it will allow the translation of written test cases into test configurations. The application will be developed in C++ programming language. Student will gain: Improved C++ programming skills. Chance to learn and apply design patterns Good knowledge of automotive communication protocols, libraries and tools used in automotive industry. Experience working on top projects for famous automotive clients. Insight in test automation for automotive software.	Technical university student 3rd or 4th year student is a plus Medium C++, Java programming skills Medium OOP knowledge Basic microcontroller understanding is a plus Willing to work intensively to improve technical skills and C++ programming knowledge	C++ (preferred) or Java	1

Nr.crt.	Title	Description	Technical knowledge required	Tests	Nr. Stud
46	eHorizon MQTT Application for Data Management	Aim of the project is to develop an application to enable the user to transfer data bi-directionally through the internet to eHorizon device using the MQTT protocol over WLAN and GSM. The student must implement a user-friendly application which will enable the transfer of large size data remotely to the embedded devices running in vehicles. Application will be developed in QT environment and C++ programming language. Student will gain: Improved C++ programming skills Chance to learn and apply design patterns Good knowledge of high-end communication protocols, libraries and tools used in automotive industry. Experience working on top projects for famous automotive clients.	Technical university student 3rd or 4th year student is a plus Medium C++, Java programming skills Medium OOP knowledge Basic microcontroller understanding is a plus Any experience using GUI (QT, Windows Forms or similar) is a plus Willing to work intensively to improve technical skills and C++ programming knowledge	C++ (preferred) or Java	1

Nr.crt.	Title	Description	Technical knowledge required	Tests	Nr. Stud
47	Smart Watch Connectivity for a Diagnostic On Board Unit.	The Continental Universal Telematic Equipement (CUTE) device offers a wireless interface to a vehicle over which the user can read out diagnostic information of that vehicle. The present conectivity of the CUTE On Board Unit(OBU) is GSM and Bluetooth 3.0 . The idea of the thesis is to analise and implement bluetooth 4.0 conectivity of the CUTE OBU. After the fist proof of concept the student shall implement a use case which involve bluetooth 4.0 connectivity while also researching several features that can be implemented based on the new low-power bluetooth. A first potential feature would be offering the data which is aquired by the OBU to a smart-watch to the user. Other potential features are: Connectivity to a head-up display. Connectivity to smartphone. The subjects covered during this project are: Bluetooth Communication. Also the student shall gain knowledge about may embedded software modules which are inside the OBU thus gaining knowledge in the following subjects: GPS, GSM communication, Accelerometer, Gyroscope, and Vehicle Diagnosis.	Basic Embedded Systems, ANSI C	ANSI C, microcontrollers	1
48	CAN I/O Control	1. Develop an embedded application to change the outputs of an ECU based on information received in a CAN message. The application has to check the received information and if it is valid then change the value of the outputs accordingly. Otherwise, it has to provide the correct diagnostic values 2. Develop an embedded application that sends a CAN message based on the inputs of an ECU. The application has to check the input values and based on predefined values, it has to send a CAN message to one ECU or another.	Basic uController knowledge, C, Analytical thinking	ANSI C, microcontrollers	3

Nr.crt.	Title	Description	Technical knowledge required	Tests	Nr. Stud
49	DB Compare Tool	Compare MS Access databases: structure and data The application requires to: - compare the structures of databases - read and compare data from databases - create a clean and straightforward user interface for showing the differences - merge the differences between databases	C#/Java, OOP, General DB knowledge, Logic, Windows User Interface (custom controls, data exchange, user interaction), Ability to read, understand and follow a basic set of requirements	C++/ C#/ Java	2
50	Multimedia Info Panel Tool for ECU Projects	The goal is to develop a Multimedia Info Panel tool which allows the user an easy and direct access to a specific picture , movie , 3D data or virtual data related to a manufacturing process , test process , product exploded 3D view etc. The multimedia info panel should help the user to visualize relevant information about a project or a product in a direct and straightforward manner. Movies and pictures should be taken and edited in a (semi)- professional manner (in manufacturing sites , testing facilities , in the car etc.) and accessed via the requested tool.	Programming skills (multimedia related)	C++, Java	1
51	Supplier database and documentations	Supplier data base created in excel (Marco would be a plus); All data will be collected from the colleagues which are in charge of materials; Supplier code, name, contact person, escalation matrix; Lead time for each component, way of transport Incoterms; History with good examples and bad examples and the way of handling by suppliers	Excel advanced SAP is a plus	No technical test is required	1

Nr.crt.	Title	Description	Technical knowledge required	Tests	Nr. Stud
52	Cockpit Modules for Human Machine Interfaces based on new technologies	Design and Build Human Machine Interface cockpit modules, based on an existing development platforms (choose from Arduino, BeagleBone, RaspberryPi, MSP430 Launchpad, etc) but with integration of new technologies (e.g E-Paper, OLED) What needs to be done: 1. Define the architecture. 2. Choose the existing development platform (from Arduino, BeagleBone, RaspberryPi, MSP430 Launchpad, etc) 3. Schematics for the shield board, containing all the signal conditioning 4. Layout of the PCB, Bill of Materials, 5. Building and testing the prototype 6. Start software development (could be done by a second team member) 7. Finalize with a presentable demonstrator stand	Strong understanding of electronics Advanced knowledge of electronics, control systems, software algorithms, C programming language.	HW, SW	5

Nr.crt.	Title	Description	Technical knowledge required	Tests	Nr. Stud
53	DashBoard Module for Formula Student Car	Design and Build a DashBoard module for a Formula Student Car, based on an existing development platform (choose from Arduino, BeagleBone, RaspberryPi, MSP430 Launchpad, etc). The Dashboard module should get the information from the vehicle CAN network, and also from discrete inputs (Analog, digital and frequency inputs). The Dashboard module should display at least the speed, RPM, Gear, Engine Status. What needs to be done: 1. Define the architecture of dashboard 2. Choose the existing development platform (from Arduino, BeagleBone, RaspberryPi, MSP430 Launchpad, etc) 3. Schematics for the shield board, containing all the signal conditioning 4. Layout of the PCB, Bill of Materials, 5. Building and testing the prototype 6. Start software development 7. Integration in the Formula Student car	Strong understanding of electronics Advanced knowledge of electronics, control systems, software algorithms, C programming language.	HW, SW	1
54	Fixation methods of a aluminum housing with a plastic cover	The project consists in finding and using different methods of fixing the two (aluminum and plastic) components in terms of technical, economic and assembly aspects	CAD, FEA, Strength of Material, Machine components	MD	1
55	Numerical simulation of assembly solution	The project consists in simulation of different types of assembly and validate them using Finite Element Analysis. In the first step the candidate has to simulate functionality of the product using FEA method. In the second phase he will have to choose optimal solution and validate it	ANSYS, FEA, Strength of Material, Machine components	MD	1

Nr.crt.	Title	Description	Technical knowledge required	Tests	Nr. Stud
56	Automated Signal Analysis Environment	The target of the project is to define and develop "Automated Signal Analysis Environment" together with the team. The tool shall be able to analyze/verify if the communication protocol (SPI, UART, etc) between 2 components is correct or not. The communication signals are stored in CSV (comma separated values) files format. The following steps shall be followed: - Concept refinement (basic requirements for the tool) - Implementation of valid communication description in xml - Implementation of the CSV files analysis in C# - Verification of the implementation using test vector files	C, C#	ANSI C, microcontrollers	1
57	Automated HIL Environment for Remote Keyless Entry SW	The target of the project is to develop test scripts for HIL (Hardware In the Loop) test environment for embedded systems, specific to Remote Keyless Entry function. The following steps shall be followed: - Learning the script language - Learning car access software - Learning test techniques - Implementation of various tests for car access generic SW components	C, embedded SW	ANSI C, microcontrollers	1

Nr.crt.	Title	Description	Technical knowledge required	Tests	Nr. Stud
58	Secure vehicle Access and Start via Near Field Communication (NFC)	The purpose of this project is to define and implement together with the team a system which can be used for secure Access and Start of the car using a smartphone. Communication channel between car and smartphone is NFC and this should be secure. The phases of the summer practice project are: - Definition of the concept (use case scenarios, data flow, communication channels). - Security concept that can be embedded into project concept. - Implementation of the server (e.g. secret key exchange) - Implementation of a smartphone application - Implementation of the software on embedded hardware.	C, Microcontroller, Java knowledge. C# knowledge, Android development experience and web application servers (eg Apache Tomcat) knowledge are a plus	ANSI C, microcontrollers	2
59	Display test tool chain	Background: The Commercial Vehicles Instrument Clusters usually have a display for providing information interface to the driver. Several display types are supported: monochrome dot matrix or TFT color displays. Project proposal: A tool chain must be created that allows automatic regression testing of graphical subsystem. This would need to have an interface to the graphical design tool where all the graphic objects are created/integrated (PC) and also to the embedded target used for displaying the objects. Objects generation, data acquisition, storing and comparing of outputs should be provided by the tool chain. In the end the effort spent for regression test of the graphical subsystem should be reduced.	C, C++, C#, XML language, basic embedded knowledge, CAN	ANSI C, microcontrollers, C++, C#	1

Nr.crt.	Title	Description	Technical knowledge required	Tests	Nr. Stud
60	Optimization of gear-train	The project consists in calculation of a mathematical model to predict the overall efficiency of a two or three stage gear train based on parameter which influence the power loss: -rolling friction loss -sliding friction loss. The optimal dimensions/performance ratio estimation and optimization of design using Finite Element Analysis	CAD, FEA, Strength of Material, Machine components	MD	1
61	Embedded application for proximity measurement	Embedded SW for proximity (distance) measurement based on ultrasonic technology. Expected measurement range: 5 – 50 cm.	Microcontrollers (ATMEGA8 / ATMEGA16) C programming language TDC1011, SP37 integrated circuits Electronics, signal processing	ANSI C, microcontrollers	1
62	Dynamic graph visualization of the base software architecture in an instrument cluster project	Develop a PC software tool (C#) which generates a graphical overview of the embedded software architecture for an instrument cluster base software project. The tool will use as input configuration files (pseudo language format) of the base software modules. Main tasks: - Understand software architecture of an instrument cluster base software project - Parse input files and store useful information in internal data structures - Develop a PC tool which is using existing library for graphs representation to visualize in a dynamic way details about software architecture	ANSI C, Embedded systems / Microcontrollers	ANSI C, Microcontrollers, C#	1

Nr.crt.	Title	Description	Technical knowledge required	Tests	Nr. Stud
63	Online Tester alternative for Model Based projects	The purpose of this project is to develop an application in C# to help the developer in debugging a Model Based project on a target. The application will be capable of: - Communicating with an ECU on CAN - Supporting multiple threads: o Threads for sending and receiving messages o Threads for the UI - Displaying information in graphics - Logging the information retrieved from the ECU	ANSI C, C#, Simulink(optional)	ANSI C; C#;	1
64	Demo Application for an Embedded Linux Platform	Our group is responsible with creating a modern platform that offers various services for our application developers such as: - Bluetooth - Wi-fi - GPS - GSM/3G - Touchscreen - USB Connection We want to develop a demo application to showcase the various functionalities that our platform has to offer. During your summer practice, you will learn to use the APIs to use the technologies mentioned above and you will be part of the development effort for this brand new demo app.	Experience with an OOP language (C++ or Java) Some embedded experience would be a plus Some Linux experience would be a plus Some GUI design experience would be a plus	C++, JAVA	3
65	Lightweight Profiling Tool for a Linux Based Embedded Platform	We need your help in creating a lightweight tool that can parse automatically generated profiling logs and interpret/classify the data. The processed and filtered information would then be represented via custom visualizations.	Experience with an OOP language (C++ or Java) Some embedded experience would be a plus Some Linux experience would be a plus	C++, JAVA	1

Nr.crt.	Title	Description	Technical knowledge required	Tests	Nr. Stud
66	Planning Synchronization Tool	We, in the Dynamic Platform group, use two tools in our day to day work. - A tool to track the issues and features that need to be implemented - A tool to track the work of our team on the issues and features to be implemented (AGILE) We want to create a mechanism to synchronize these tools in order to automate the planning and reporting process.	Experience in an OOP language (C++ or Java) Some shell scripting experience would be a plus	C++, JAVA	1
67	OS with minimal ROM footprint for embedded sw application	While(1) OS with interrupts and tasks support. Interrupt support and tasks support to be introduce in an while(1) operating system. Preemptive task activation mechanism (a task with a higher priority can interrupt execution of a task with lower priority) is required (task execution context (stack, program counter) shall be preserved/restored). ROM consumption is to be kept to a minimum. And/Or Vector Informatik OSEK with minimal configuration providing the same feature as the While(1) OS described above.	C, microcontrollers	ANSI C, microcontrollers	1
68	Unit Test Dependencies Stubbing	Unit Tests stubs should be used to simulate the behaviour of dependencies of one application. In general the stubs are unable to cover the entire functionality of used dependencies and Unit Tests usage in testing the application functionality is limitted by this. A more detailed implementation for stubs of each application dependency will enable the possibility of testing the functionalities and will simplify extention of one application when adding new features.	C & CPP advanced level, linux, scripting (bash, shell) Nice to have: Qt Framework , python	ANSI C	1

Nr.crt.	Title	Description	Technical knowledge required	Tests	Nr. Stud
69	PC emulator for connectivity smartphone applications	Creation of a desktop application in Qt that will allow developers to test their implementations without having to flash the modifications on target. Developers could use this application for debugging problems on PC and will simplify their activity, saving time.	C & CPP advanced level, linux, scripting (bash, shell) Nice to have: Qt Framework , python	ANSI C	1
70	User-friendly application for test beginners	Build a user-friendly web application to be used by new functional test engineers to simplify the integration period. This application will be also used by the mentor as support and also for monitoring the evolution of the new employee. The application should contain: - Well organized information (administrative and technical) - For the technical part: multiple examples (including video) from real test scenarios of a cluster or a display, equipment/test bench, verification tests.	HTML5, JavaScript, Python/Java/C#/PHP	Java, C#	1
71	Interior Camera Recording Stand	Make a software that replicates driving scenarios used for the interior camera algorithm tests. A 3D environment scenario of city and highway driving. Input should be a steering wheel, acceleration and brake pedal . At certain moments in time the software should be able to set markers. This would be done using already existing software from the car. Stand would be made of a large TV (or monitors, projector would take too much space), a chair from a car, steering wheel, pedal stand (from computer gaming) and 2 computers (one for recording , the other for the environment).	OpenGL, Java, C, C++, C#	C++ or C# or Java , IT	2

Nr.crt.	Title	Description	Technical knowledge required	Tests	Nr. Stud
72	Automated test for LEDs on cluster instrument display	Analyze, define and present solutions for LED testing, using different HW interfaces: vision camera, Vector hardware or others. Steps: 1. Define the test solutions 2. Analyze the feasibility of each solution 3. Present the solutions 4. Implement the chosen solution.	Java, C, C++, C#	C++ or C# or Java , IT	1
73	Automated test for HMI on segmented displays	Automatically tests segment displays. The solution contain 3 functionalities: 1. Down sample from the cluster 2. Generate reference picture 3. Compare the picture from the cluster with the reference picture. 4. Automatically calculate the result. Development steps: 1. Propose and review the down sample solution. 2. Propose and review the reference picture generation. 3. Propose and review the comparison solution Implement agreed solution.	Java, C, C++, C#	C++ or C# or Java , IT	2

Nr.crt.	Title	Description	Technical knowledge required	Tests	Nr. Stud
74	IDSW RF Tool	The purpose of this project is to define and implement together with the team a GUI which can be used for receiving and decoding RF frames from a remote keyless device. The scope of this tool is to help the team during the project development phase. Tool shall have the following main features: - HW used : development board from NxP - User friendly GUI - Real-time RF acquisition - RF parameters configurability - RF data parsing The phases of the summer practice project are: - Definition of the concept - Implementation of the tool - Testing in real project	C, Microcontroller, C#/C++ knowledge	ANSI C, microcontrollers, C++/C#	1
75	IDSW Static Code Analyzer Tool	The purpose of this project is to define and implement together with the team a tool which can be used for analyze of C-written source code in remote keyless projects. Tool shall have the following main features: - CPU load analysis - shared variables analysis - stacj usage alaysis - call tree analysis (function calls , modules interaction) The phases of the summer practice project are: - Definition of the concept - Implementation of the tool - Testing in real project	C, Microcontroller, C#/C++ knowledge	ANSI C, microcontrollers, C++/C#	1

Nr.crt.	Title	Description	Technical knowledge required	Tests	Nr. Stud
76	Improving the functionality of an existing product	The project consists in finding and using alternative solutions for an existing product (e.g. General Purpose Actuator). In the first step the candidate has to observe and understand the functionality of the product. And in the second phase he will has to develop a new product with the same functionality but using alternative and better solutions.	CAD, FEA, Strength of Material, Machine components	MD	1
77	Frequency Generator Unit – performance analysis	Background: The Commercial Vehicles Instrument Clusters and Body Control Units are frequently using generated frequency signals for controlling some sensors or other ECU's from the truck. Project proposal: Performance analysis for the units that can generate output frequencies must be done. This must include the unit usage from internal point of view, frequency generation limitation, ISR latency, low level signal generation methods.	C, basic embedded knowledge	ANSI C	1
78	Electrical Scooter	The project consists in defining specification, implementation and testing of an electrical scooter, using a TCU (Transmission Control Unit), electrical battery, control panel.	electronic components, microcontrollers and microcontroller programming	Microcontrollers, HW, C++, Java, Labview	2

Nr.crt.	Title	Description	Technical knowledge required	Tests	Nr. Stud
79	Runtime Measurements in an Embedded Automotive System	Background: The Commercial Vehicles Instrument Clusters are embedded systems that are based on a real time operating system. Ensuring the right timings are critical for the correct system execution. Project proposal: In a given embedded system, different timings must be measured by using an existing runtime measurement environment (target + tool). Measurements must be done for: Startup and shutdown sequence, ISR timings, runtime execution, system running in a stress environment. Integration of the timing markers, documenting and analysing the results must be done.	C, basic embedded knowledge	ANSI C	1
80	Numerical simulation of sealing solutions between two components (aluminum housing with a plastic cover).	The project consists in simulation of different types of sealing and validate them using Finite Element Analysis. (sealing between two components aluminium and plastic) In the first step the candidate has to simulate functionality of the product using FEA method. In the second phase he will has to choose optimal solution and validate it.	CAD, FEA, Strength of Material, Machine components	MD	1
81	Different methods of sealing the two components (aluminum housing with a plastic cover).	The project consists in finding and using different methods of sealing between two components (aluminium and plastic) concerning technical, economical and assembly aspects.	CAD, FEA, Strength of Material, Machine components	MD	1
82	QTools Development	QTools is a collection of applications which perform software metrics and static code analysis. The tool has been recently redesigned and has opened the doors for new features.	Java, XML, RegEx, Perl	Java	1

Nr.crt.	Title	Description	Technical knowledge required	Tests	Nr. Stud
83	Automate testing	The IIC department is providing Software for Infotainment systems. An important step of the software lifecycle is to validate that it meets the customer expectations, that it functions according the specifications. Automate as many test scenarios will increase the test coverage, will decrease the number of problems that are not observed by manual testing. We are using an automated test platform in order to write test cases. Main responsibility: automate test cases. Beside that, he will participate to the real test process, part of kanban process used. The student will be part of a software development team, being in close contact with software architect, developers, testers in order to get all information needed.	basic knowledge of programming C, C++	ANSI C, C++	2
84	Hardware in The Loop – Test tool extensions	Create new test features for embedded software for the case when the software is tested together with the microcontroller and the electronics (software hardware integration tests and requirements verification tests). Drivers shall be integrated in the test tool which handle: - Communication with different devices connected to the PC on USB port, PCI or PCI Express slots	Knowledge in the following domains is an advantage: win32 api, Java, XML, XSL, API design, electronics, signal filtering, microcontrollers, network communication	C++	1

Nr.crt.	Title	Description	Technical knowledge required	Tests	Nr. Stud
85	Test Tool Development Support	If you ever wondered how a PC based Testing Application is built – here is your chance. This Summer we are looking for some more eager young minds to join TestTools Family. You would do some to all of the below : - Be part of an awesome Team - Supporting Teams of Test Tool Developers in their daily Tasks. - Developing Applications in Labview, CAPL, C#, VB. - Learn on the job - Figure out what you like to work for fun - Extend your working experience , Professional Network - Enjoy our company Don’t be a Tool , Make a Tool .	Curiosity, Pragmatic Mindset, Hunger (Capacity and Drive to Learn) Basic Programming Skills in any Programming Language. Medium to Advanced Programming Skills is a plus	ANSI C, Java, C++, C#	2
86	Qt test application	Application goals: - develop an application for testing Qt framework in the context of automotive environment.	C++ and Object Oriented Programming, UML, Linux. Nice to have knowledge: Qt framework	C++	1

Nr.crt.	Title	Description	Technical knowledge required	Tests	Nr. Stud
87	Arbor GUI Extension	Intro >> Arbor is a language (a so called DSL - Domain Specific Language), used in our projects for solving variant handling problem (possibility to chose different variants of the system) Why ? The problem : >> In the actual status the content is handled textually only ==> big files (> 1000 lines) ==> hard to maintain The solution : >> Possibility to maintain the content via a GUI So the project will have to do the following : >> extend the existing textual editor if necessary >> add different GUI interfaces (to add, remove, have an overview over variants, ...) Note: >> in the moment the existing editor is done in the so called RCP (Rich Client Platform), but as a first one of the task can be to found another easy to maintain GUI editor (e.g.: GUI in python)	Java, OOP knowledge	Java	2
88	Buzzer priority automatic test	The project aims to create an automated test sequence for testing the prioritization between all the buzzer codes available on Fiat projects. The application follows to activate all possible combinations of buzzers and monitor de output. The project will be done using: CAPL, CANoe simulation, VBA and Multi.	VBA, C	ANSI C	1

Nr.crt.	Title	Description	Technical knowledge required	Tests	Nr. Stud
89	Generate an CINEMA 4D model using a XML model description	The scope of the project is to implement a CINEMA 4D plug-in witch take as an input a XML description in a custom format and translate it in Cinema 4D Model. The following functions have to be provided: - Read and parse the XML file. - Generate a configuration based on XML data. - Create resources - Create CINEMA 4D objects - Conect the object with resources	C++	C++	2
90	Headcount Tool	The HCT is a tool that stores relevant and diverse information about employees: contract types, norms, personal data (name, surname), historical data of the occupied positions in the company etc.. The output of this application is a series of reports and statistics based on stored data. The main challenges of such an application are related to security and data protection. The application must map the matrix organization of Continental Automotive Romania. The permission concept must be aware of a lot of restrictions for accessing data by right person. The application will have several other features: notifications about data changes for one employee, notifications about contract changes, generation of organization charts. The application shall be developed in C#/.NET and uses a MS SQL database. An Agile (Kanban) method is used in the development process.	OOP, OOD, at least one object-oriented language (C# is preferred). Relational database knowledge, SQL language.	C#, Java or C++	1

Nr.crt.	Title	Description	Technical knowledge required	Tests	Nr. Stud
91	HMI tools	The project aims to round up a set of existing tools into one single tool with a GUI and also to add some new features which would help the HMI team working on Fiat projects. Currently, the following tools are available: exporting texts from excel file, exporting fonts, exporting icons from .psd images. The plan is to merge the 3 tools into a single tool, with a user friendly graphic interface and to add a check at the end of the exporting to see how many fonts were used for creating the .psd images. In this way, we check that the customer sends the .psd images only in the font which was agreed.	C#	C#	1
92	Image Source and Multimedia Device	We want to further develop our Image Box systems to use latest Single Computer Boards like Olinuxino, Odroid, Raspberry. The results of the project will be new Image Box that will be produced by Sample Shop and widely used in IID	Microcontrollers C/C++ base knowledge about Linux / Android, desire to learn better Linux and Android OS	ANSI C, microcontrollers	4
93	InfoRepetition automatic test	The project aims to create an automated test sequence for testing the audio, phone and navigation functionality for Fiat projects. Based on the CAN dbc we will have to generate all the possible values which can be sent through CAN from the Radio to the IPC and see if they can be represented correctly on the display of the IPC.	VBA, C	ANSI C	1
94	Scorecards project	This project targets the development, in either Visual Basic or Java, of automatic relations between several Excel data files. Data provided in the input files must be subjected to several validations for different levels of correctness. Important for this project is as well the automatic generation of charts based on the collected data.	OOP, OOD, at least one object-oriented language (Java is preferred) or Visual Basic	Java, Visual Basic	1

Nr.crt.	Title	Description	Technical knowledge required	Tests	Nr. Stud
95	Scripts for day to day work	The following scripts could be useful for day to day work on Fiat projects: - Automatic generation of RAM/ROM consumption for integration test based on the memory consumption generated from Visual Studio - Adaptation of the dataset comparison tool used on projects with only physical EEProm to work on projects with FEE - GUI for DOORS traceability tool which is used to generate RAM/traceability reports - Automatic generation of .prg files for integration	VBA, C, C#, python	ANSI C, C#	1
96	SEM Automatic Test	The project aims to create an automated test sequence for testing the State Event Matrix document in the Fiat project – prioritization between all the types of warnings which can be triggered by the IPC. The application will follow the steps: - Creating a mapping in excel between the name of the environment variables which trigger the warnings and the indication ID from the application - CAPL code to generate the indications based on the excel above - Monitoring the output (which ID is on the display) using Multi scripts	VBA, C	ANSI C	1
97	SQA optimizations	Development of tools in a OOP language to optimize SQA tasks. The project will generate automatically several reports for the Quality Engineer, based on information collected from documents stored in Configuration Management systems.	OOP - at least one object-oriented language, OOD.	Java (preferred) , C# or C++	1

Nr.crt.	Title	Description	Technical knowledge required	Tests	Nr. Stud
98	Test Generator Tool	The project aims to create a Web-based solution generating automatically tests for candidates who apply for open positions or summer practice jobs. The solution allows users to create and store questions, as basic elements, for testing candidates' knowledge in different areas. The data area stored in a dedicated database. The application main goal is to generate one or more tests containing questions from the backend database, which would fulfill certain input criteria: - Number and name of sections in the test - Selected difficulty/complexity of included questions - Amount of time necessary for completing the test The application will have several other features: storing generated tests, possibility to customize tests, database and application security handling, test profile storing etc. The application shall be developed in C#/.NET and uses a MS SQL database, and an Agile approach is used as in the development process (Scrumban).	OOP, OOD, at least one object-oriented language (C# is preferred). Ajax, JavaScript. Relational database knowledge.	C# (preferred), Java or C++	1

Nr.crt.	Title	Description	Technical knowledge required	Tests	Nr. Stud
99	Automatization of selected module tests	A central software facilitates the execution of Vector CANoe macro files directly from the Excel documents that also contains the manual test steps corresponding to each automated macro. The creation of CANoe macro files is done through recording of the changes resulted after the manual execution of described input test steps. Once documents are updated with a corresponding macro for the manual input of each described test, they are saved in the versioning system. Tasks: -update of central software that handles the interface between Excel and Vecto CANoe -recording of macros and manual execution of described input test steps in Vector CANoe -version management and process related tasks	C, Excel VBA (optional)	ANSI C	2
100	Continuous Integration Scripts	The project aims to create some scripts for continuous build and continuous test of SW systems. Such scripts are responsible for testing basic functionality of Head Up Displays or generation of specific metrics like static analysis of the code. Several scripting languages can be used, the preferred one being Python.	Python or other scripting languages	Ansi C	1
101	Demo Software for Instrument Cluster	The project aims to create a demo software for an Instrument Cluster. This means that the original software has to be changed so that the cluster instrument works without CAN environment, by redesigning modules that turn on the leds, trigger the warnings on the display or modules that move the pointers. The software system will be developed in C programming language	C	Ansi C	1

Nr.crt.	Title	Description	Technical knowledge required	Tests	Nr. Stud
102	Test Automation for Personalization Functionality in Kombi Instrument	The project aims to create a test frame for Personalization module for an instrument cluster. Personalization module ensures that various drivers can find their individual settings directly after vehicle activation. The user selection and administration of scopes defined for the personalization takes place in the combined instrument. The module and also the test frame will be developed in C programming language.	C	Ansi C	1
103	Test Automation for Trip Computer Functionality in Cluster Instrument	The project aims to create a test frame for Trip Computer package for an instrument cluster. The Trip Computer functionality is responsible for acquiring information from the communication network inside the car and process this data in order to obtain values for Average Fuel Consumption, Average Speed, Driving Distance, Instantaneous Fuel Consumption or Range. The module and also the test frame will be developed in C programming language.	C	Ansi C	1
104	ATP infrastructure for SW Verification Tests within OVIP Media W2/W3	The goal of this Project is to develop an infrastructure which allows the Business Logic code to be tested using automated tests (ATP). It consists in a layer which allows ATP to connect to the Media BL and access the interfaces which are available for other layers to be tested by.	C++ and Object Oriented Programming, UML, Linux, basic Hardware and Media knowledge are a plus.	C++	2

Nr.crt.	Title	Description	Technical knowledge required	Tests	Nr. Stud
105	System Timeline Player	Application goals: - end user will be able build a customizable view (html like) representing a system, or a sub-system that has a evolution in time - interpret traces to restore timeline evolution of the system, with input based on log & trace files or live-stream, and present it in the view - playback for the represented system within the custom defined view Benefit: offer the possibility to view or replay a system's functional flow, quickly find and identify problems and inconsistencies Application goals: - end user will be able build a customizable view (html like) representing a system, or a sub-system that has a evolution in time - interpret traces to restore timeline evolution of the system, with input based on log & trace files or live-stream, and present it in the view - playback for the represented system within the custom defined view Benefit: offer the possibility to view or replay a system's functional flow, quickly find and identify problems and inconsistencies	C++ and Object Oriented Programming, UML, Linux, basic Hardware and Media knowledge are a plus.	C++	1
106	Test Human Machine Interface for Radio/Media/Audio platform	The user interface which has to be developed has to permit basic Radio operations like tune, search, radio station selection from list and also has to display current radio station information, radio lists, announcement status, radio state and other radio information. In a symmetric way it shall be defined for media and audio. Communication with platform application will be done using dbus.	C++ and Object Oriented Programming, UML, Linux, basic Hardware and Media knowledge are a plus.	C++	2

Nr.crt.	Title	Description	Technical knowledge required	Tests	Nr. Stud
107	Improvement of fast flash programming time	Specific software (called test software) is used on the production line to detect failures of the product (engine control unit (ECU) in this case) and to flash the final code needed to run the car. The software component used to flash the final code must run as fast as possible to reduce the costs during the production line. The final code is transmitted to the ECU via CAN (Controller Area Network) interface at specific baud rates with a dedicated hardware tool. The software must receive and process the received data as fast as possible to accelerate the programming time. The project involves analysis and implementation of improvements that can be done to accelerate the flash process (e. g. transition of reception code from polling to interrupts, improvement of algorithms etc.).	Embedded programming for microcontrollers (e. g. interrupts mechanism, real time operating systems).	ANSI C, microcontrollers	1

Nr.crt.	Title	Description	Technical knowledge required	Tests	Nr. Stud
108	Develop test vectors for security encryption schemes	Develop a tool in Java that generates /calculates proper test vectors for a multitude of cryptographic protocols. Encryption is used to achieve data security. It converts the data of a plain text into an unreadable text called the cipher text. Decryption converts back the cipher text to plain text. This encryption/decryption of data is part of cryptography. It requires the use of a secret information, called the key. Symmetric key cryptography refers to encryption methods in which both the sender and receiver share the same key. Asymmetric key cryptography (also known as public key cryptography) refers to a system that requires two separate keys, one of which is secret and one of which is public. Both types of cryptography will be handled by the tool. Algorithms like RSA will be implemented in the tool code. Classes like Signature,MessageDigest will be used from Java libraries but also algorithm code will need to be developed.	Java	ANSI C, microcontrollers, Java	1
109	McAfee infrastructure migration (Regensburg -> Frankfurt)	Project for migrating Corporate Infrastructure from Regensburd Datacenter to Frankfurt Datacenter.	IT Infrastructure skills – Networking, Software Installation, Windows XP/7 OS	IT	1
110	VitalQIP 8 Project	Support the Corporate Network and Voice team during the rollout of the new DNS/DHCP/IP Address Management solution and new feature set.	IT Infrastructure skills – Networking, Software Installation, Windows XP/7 OS	IT	1

Nr.crt.	Title	Description	Technical knowledge required	Tests	Nr. Stud
111	Dynamic Regression Test implementation	Development of a dynamic test to cover a given requirement. The script will have to use TAS test equipment to fulfill the test cases preconditions, input values and perform the evaluation using Matlab function to determine automatically the status of the test cases.	Matlab, Simulink	Matlab	1
112	K1 and K2 metrics improvements for aggregates implemented in Timisoara	Improve code test coverage to 100% and reduce to 0 the coding rules violations for aggregates with responsibilities in Timisoara, strategy on Hyunday diesel project.	Low level programming (C, embedded C)	ANSI C	1
113	Specification checker	The student should create a tool that parses a xml LIMAS specification and checks if all the variables used and calculated in that specification are described in tables. The same tool should also be able to perform ACG (automated code generation) from an xml spec (create the structure inside a *.c file based on the strategy from xml specification).	High level programming (C++ or C# or Java)	C++, C#, Java	1
114	Model based development for exhaust gas recirculation actuator	The Exhaust Gas Recirculation (EGR) component is the part of air system that controls the amount of engine's exhaust gas which will be redirected back into the engine cylinders in order to reduce the NOx emissions. The EGR position is determined by closed loop control algorithm: the goal is that the actual EGR position, calculated based on the sensor feedback signal, reaches the desired position within a certain time and with minimum admissible deviation. In this summer practice project you will have the chance to develop and improve the EGR actuator control strategy by using a Model Based Development and Automatic Code Generation technology using Matlab/Simulink tool chain.	Matlab/ Simulink: basic Hardware: basic C : basic	ANSI C, Matlab	1

Nr.crt.	Title	Description	Technical knowledge required	Tests	Nr. Stud
115	Automated test Equipment Switch	Your task is to improve the characteristics of an existing electronic switch design. The switch will be used inside an Automated test equipment. Expected results are improvement of the switching time and reduction of the parasitic capacitance of the switch. What needs to be done: 1. Analyze and understand the current solution used for the electronic switch 2. Search for new market components (MOS's) with better characteristics than the existing one. 3. Design and simulate the new proposd schematic 4. Build and test a prototype 5. Prepare the design for small series production	Self-motivated, with strong learning abilities Strong understanding of electronics	HW	1

Nr.crt.	Title	Description	Technical knowledge required	Tests	Nr. Stud
116	DashBoard Module for Formula Student Car	Design and Build a DashBoard module for a Formula Student Car, based on an existing development platform (choose from Arduino, BeagleBone, RaspberryPi, MSP430 Launchpad, etc). The Dashboard module should get the information from the vehicle CAN network, and also from discrete inputs (Analog, digital and frequency inputs). The Dashboard module should display at least the speed, RPM, Gear, Engine Status. What needs to be done: 1. Define the architecture of dashboard 2. Choose the existing development platform (from Arduino, BeagleBone, RaspberryPi, MSP430 Launchpad, etc) 3. Schematics for the shield board, containing all the signal conditioning 4. Layout of the PCB, Bill of Materials, 5. Building and testing the prototype 6. Start software development 7. Integration in the Formula Student car	Self-motivated, with strong learning abilities Strong understanding of electronics Advanced knowledge of electronics, control systems, software algorithms, C programming language.	HW, SW	1

Nr.crt.	Title	Description	Technical knowledge required	Tests	Nr. Stud
117	Electronic Circuit Simulation of a Injector Driver	Your task is to use a circuit simulator(Saber) to simulate a Injector Driver Circuit. You would have to create the schematics circuit and simulate it. Perform power dissipation analysis, sensitivity analysis with components tolerance, temperature sensitivity. Analyze all the parameters of the circuit and propose improvements of the circuit. Additionally, a diagnosis concept needs to be designed so that all the electrical failures that can happen in an automotive environment are detected by the circuit. The circuit needs also to be analyzed using the worst-case methodology and Failure Mode and Effects Analysis. You will be guided through your student practice by a mentor which will explain to you the methodologies which are not known to you.	Self-motivated, with strong learning abilities Strong understanding of electronics	HW	1

Nr.crt.	Title	Description	Technical knowledge required	Tests	Nr. Stud
118	Engine Control Unit Hardware testing	Test the Engine Control Unit module that controls the Engine of a Car. You will test different ECU's for different suppliers, equipped with latest technologies. You will get knowledge about ECU modules (Analog Inputs, Digital Inputs, Crank sensor, Injector Driver, Throttle control, CAN communication). Your task would be to find design faults inside the design and create test reports to document the tests. You will be using equipments as oscilloscopes, multimeters, signal generators. You will learn how to control remotely all the equipments, using specific script files. During your summer practice you will be guided by a mentor.	Self-motivated, with strong learning abilities Advanced knowledge of electronics, control systems, software algorithms	HW	2

Nr.crt.	Title	Description	Technical knowledge required	Tests	Nr. Stud
119	Power Electronics Module	Your task is to work togheter with the design team of the Power Electronics Switchin Module for Electronic Heating of the Catalyst. You will work to create the concept and test the Power switching module. The purpose of the module is to control the electronic heating of the catalyst at the starting of the engine. The catalyst needs to heat up to 700°C in order to start the catalytic reaction on the Exhaust gasses and reduce emissions of the car. The main challenge is to switch 100A from the vehicle battery voltage in a controlled way, with possibility to diagnose over-current and open Load conditions. A mentor will guide you during your summer practice period.	Self-motivated, with strong learning abilities Strong understanding of electronics	HW	1

Nr.crt.	Title	Description	Technical knowledge required	Tests	Nr. Stud
120	Sensor Module for Formula Student Car	Design and Build a sensor Module for a Formula Student Car, based on an existing development platform (choose from Arduino, BeagleBone, RaspberryPi, MSP430 Launchpad, etc) and a PCB shild that you would create. The device needs to have a housing and connect to the vehicle wiring harness. The sensor module should read 8 analog inputs, 8 digital Inputs and 4 frequency inputs. The data should be sent by CAN interface to the other vehicle control units. What needs to be done: 1. Define the architecture of the sensor module 2. Choose the existing development platform (from Arduino, BeagleBone, RaspberryPi, MSP430 Launchpad, etc) 3. Schematics for the shield board, containing all the signal conditioning 4. Layout of the PCB, Bill of Materials, 5. Building and testing the prototype 6. Start software development 7. Integration in the Formula Student car A mentor will guide you during your summer practice period.	Self-motivated, with strong learning abilities Advanced knowledge of electronics, control systems, software algorithms, C programming language.	HW, SW	1

Nr.crt.	Title	Description	Technical knowledge required	Tests	Nr. Stud
121	Thermal Imaging Camera	Build a Thermal Imaging Camera based on the Lepton FLIR Thermal sensor What needs to be done: 1. Define the architecture of the system FLIR sensor->micro->LCD->storage media 2. Define the components to be used 3. Create a schematics, layout and bill of Materials for the project 4. Build a prototype 5. Build the software to aquire the thermal images. A mentor will guide you during your summer practice period	Self-motivated, with strong learning abilities Advanced knowledge of electronics, control systems, software algorithms, C programming language.	HW, SW	1

Nr.crt.	Title	Description	Technical knowledge required	Tests	Nr. Stud
122	Wireless communication for Formula Student Car	Design and Build a wireless communication system for a formula student car. The purpose of the module is to get the Car parameters on CAN network, and send them via an xisting communication module to the base station at the pit stop. The expected range is less than 500m in noisy environments(competition). What needs to be done: 1. Choose the communication module (433MHz module, Wi-Fi, etc) 2. Design the transmitter module, re-using a standard development board (Arduino, BeagleBone, Raspberry Pie, MSP430 LaunchPad) 3. Design the rciver module for a simple connection to the computer (USB, serial) 4. Create the Layout of the Boards, Bill Of Materials 5. Build and test the prototypes 6. Software development on the Transmitter module 7. Software development on the reciver Module (computer) 8. Integration in the Formula Student car A mentor will guide you through your summer practice period.	Self-motivated, with strong learning abilities Strong understanding of electronics, RF Advanced knowledge of electronics, control systems, software algorithms, C programming language.	HW, SW	2

Nr.crt.	Title	Description	Technical knowledge required	Tests	Nr. Stud
123	Fuel low pressure pump control using automatic code generation	You will have the chance to learn the basic principles of low pressure pump functionality by developing and improving the data acquisition and control, using Matlab/Simulink and Automatic Code Generation technology. This will involve a conversion of requirement specifications into a Simulink mathematical design. You will have to create a structure according with Continental standard architecture and last but not least you will have the possibility to test the results on real environment. In this project you will learn the development process, technologies and tools used in engine projects. All the process steps, technologies and tools will be used on real tasks.	Matlab/ Simulink: basic Hardware: basic C : basic Basics of Automotive	ANSI C, Matlab	1
124	SW development process from design and implementation to testing	Become familiar with the SW development for one of the most complex aggregate in P ES – Injection Realization. This is the control algorithm for Gasoline injector. In this project you will learn the development process, technologies and tools used in engine projects. All the process steps, technologies and tools will be used on real tasks. Scope of the practice is to understand the incremental development, the change and the configuration management and see the needs that are coming from various roles (SW Developer, Project Manager and Discipline Manager).	C languages, Microcontrollers	ANSI C	2

Nr.crt.	Title	Description	Technical knowledge required	Tests	Nr. Stud
125	Automatic generation of Garage End of Line configuration (phase 2)	The Garage End of Line (GEOL) functionality is a part of the Engine Management Software. The purpose of the functionality is to offer the possibility of different tests on engine components (injectors, actuators…) at the garage or the end of the production line. Currently, the lists of the actuators and sensors that can be tested and the needed data is defined through several modules, making it difficult to update and easy to forget updating everything. In the first phase of the tool (done in 2015 as a diploma project) following were done: -a tool that reads XML and Word specifications and extracts the relevant information for defining the list of actuators and stores them in a separate XML for each actuator module -a tool that combines all the XMLs created by the fist tool and creates the actuator list module according to the specified structure In phase 2, the tool should: -automatically create the calibration data for each actuator module, extracting the data from the XML or WORD specifications -create the actuator list in a different way in order to update the generic End of Line functionality for better	C language (medium), Java (good), XML(beginner)	ANSI C, Java	1

Nr.crt.	Title	Description	Technical knowledge required	Tests	Nr. Stud
126	ERRM final test automation tool	Into the Powertrain projects, before a project goes in production, a series of tests are done to ensure there are no interaction problems between the different functionalities included in the project. The ERRor Management functionality provides to all the other engine functionalities the interface to detect any error that can appear when the engine runs. It also provides the statistics used to determine the source of an engine failure. Because of the high interaction with the other engine functionalities, the ERRM functionality testing is a big and important part of the final test phase. The final tests on ERRM have two components: - static checks: where you have to make sure that all the functionalities use correctly the interfaces provided by ERRM - dynamic checks: done on test bench, to make sure that ERRM is correctly configured The ERRM Final Test tool is intended to do the static checks. A first phase was already created using Java, the second part must also be developed using the same programming language. The tool is intended to do the static checks and should:	Java (medium), C language (beginner), Parsing tools (Perl/Python)	ANSI C, Java	1

Nr.crt.	Title	Description	Technical knowledge required	Tests	Nr. Stud
127	Extension of integration/unitary tests for Generators EMS3 tool	In Engine Control Unit, there are many important services, e.g.: - Diagnostic Event Manager (DEM), - Function Inhibition Manager (FiM), Several components are supervised/monitored by the electronic control unit (ECU). If a malfunction is detected a diagnostic event (ERR) is "send" to the DEM. The DEM is responsible to maintain the according error entries / DTC. Different functionalities (FID) may be affected by such a malfunction. Therefore the DEM informs the FiM about the ERR. The FiM will maintain a matrix of inhibitions, the so-called FiM-Matrix, to allow/disallow a FID to execute. The Generators EMS3 tool, used by DEM-FIM, takes as input data the Autosar configuration files, process them and then it generates files needed for creation of executable which is installed on an ECU. The requirement is to extend the current testing project by adding new test scenarios implemented using JUnit.	Java (medium/good), JUnit (optional)	Java	1

Nr.crt.	Title	Description	Technical knowledge required	Tests	Nr. Stud
128	Automatic Test Cases Definition	Into the Powertrain projects we develop Software which controls the engines. The unitary test allows to test a module decoupled from the project environment, to check its proper functioning, especially in term of internal decision blocks coverage and computation checks. Unitary tests are made using RTRT language. The project consists in creating a tool which will automatically generate test cases for most common cases, e.g. OR blocks, AND blocks, various filters. A second step – depending of the progress on the step described before – consists in reading the most common blocks from Simulink models and the data definition from a central data base called Automotive Data Dictionary. In this project you will learn how specifications look and how the module test is done in engine projects. You will use Java or similar OOP language to generate the test cases for unitary tests made in RTRT language.	Java, algorithms, ANSI C, Simulink (would be an advantage)	Java	1

Nr.crt.	Title	Description	Technical knowledge required	Tests	Nr. Stud
129	Unitary Testing for Safety functionality	Into the Powertrain projects, the functionalities which control different actuators from the engine part should be monitored. This is acquired by installing an independent aggregate which check the correct behavior of the engine management functionalities. This functionality is duplicating some algorithms from first level engine management functionalities and tries to be as much as independent (e.g. acquisitions are done directly from sensors and not based on the one which is already read). This functionality is called Engine Control Module or Safety Level 2. This functionality is one of the most complex and important functionality from the Engine Management System. In this project you will learn the development process, technologies and tools used in engine projects. You will do unitary tests using RTRT language. This will allow you to build up testing competencies and to see complex C modules.	ANSI C, algorithms, Simulink (would be an advantage)	ANSI C	2
130	Audio/Phone/Navi automatic test	The project aims to create an automated test sequence for testing the audio, phone and navigation functionality for our projects. Based on the CAN dbc we will have to generate all the possible values which can be sent through CAN from the Radio to the instrument cluster and see if they can be represented correctly on the display.	VBA, C	ANSI C	1

Nr.crt.	Title	Description	Technical knowledge required	Tests	Nr. Stud
131	Automation of various tasks	The following scripts are needed for in the development of our projects: - Automatic generation of RAM/ROM consumption for integration test based on the memory consumption generated from Visual Studio - Adaptation of the dataset comparison tool used on projects with only physical EEProm to work on projects with FEE - GUI for DOORS traceability tool which is used to generate RAM/traceability reports - Automatic generation of .prg files for integration	VBA, C, C#, python	ANSI C, C#	1
132	Automatization of performance measurements	For our instrument cluster projects, we need to measure the performance of the animation in different conditions. We have a framework which we use to measure them and we want to make the process run automatically, after every build. You should build a set of scripts in order to automate the process and obtain the results in an Excel format	C/ C++, Scripting	ANSI C	2
133	State Machine Automatic Test	The project aims to create an automated test sequence for a state machine in our projects. This state machine handles the prioritization between all the types of warnings which can be triggered by the cluster instrument. The application will follow the steps: - Creating a mapping in excel between the name of the environment variables which trigger the warnings and the indication ID from the application - CAPL (from Vector) code to generate the indications based on the excel above - Monitoring the output using Green Hills Multi scripts	VBA, C	ANSI C	1

Nr.crt.	Title	Description	Technical knowledge required	Tests	Nr. Stud
134	Vehicle motion determination function design and modeling	Implement, redesign and optimize of existing generic vehicle motion functionality in Matlab/ Simulink System Design Automation (SDA) specific toolbox. The vehicle motion determination functionality consists in: › Acquisition of vehicle speed signal › Vehicle motion acquisition by CAN › Vehicle speed source priority › Vehicle speed calculation …and other	• Technical University in the field of Automation, Computer Science, Electronics and Communication. • Knowledge of controlling • Knowledge of Matlab package, special Simulink	Matlab, ANSI C	1
135	Short distance measurement using ultrasounds	The goal of this project is to develop and investigate a device (HW + SW solution) for short distance measurements. This device can be used in measuring tank fuel level or truck's pneumatic suspension. The ultrasound's Time of Flight (TOF) is processed by a microcontroller to get an accurate distance measurement.	HW design Microcontroller knowledge is a plus	HW	1
136	CAN & LIN Tester for automated testing	CAN & LIN Tester for automated testing (in LabView interface + configuration via Ethernet or USB) The scope of the study is the physical realization of a circuit with the following features: - Decode messages received from the CAN line - Decode messages received on the line LIN - To compare messages received / decoded messages stored in memory - The results can reveal visual (LED lights, or display) Optional: - To transmit CAN messages on request or following predefined events	CAN, LIN, uC, LabView	microcontrollers, Labview, HW	2

Nr.crt.	Title	Description	Technical knowledge required	Tests	Nr. Stud
137	Smart Switches Unit	The scope of the study is the practical realization of a unit containing four electronic switches, with configurable activation parameters through a user interface made with a LCD display and a rotary encoder.	uC, analogic and digital integrated circuits, C	microcontrollers, C, HW	2