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Nr. crt.	Title	Description	Requirements	Tests	hours / day
1	CAN & FlexRay testcase definition	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.	Faculty: Electronics, Automatics, Computer Science, Informatics Year of study: final year Knowledge required: Basic C programming language knowledge Basic knowledge of embedded systems, knowledge about microcontrollers English	C and microcontrollers	3 months x 2 student with 8h/day
2	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.	Faculty: Computer Science, Electronics or Electrical Engineering Year of study: II, III Knowledge required: The candidate we are looking for should have good engineering skills, able to quickly learn and adapt to new technologies and challenges.	C & HW	3 months Hours/day: 4 – 8 h\day
3	Design parts of a Instrument cluster	Design in ProE the following parts as 3D model +2D drawing: • Small light-guide - display • Main light-guide If the ProE knowledge are not available, 1 week is needed for the basic training ProE.	Faculty: Mechanical Faculty Year of study: III, IV Knowledge required: general technical knowledge / ProE	Technical Drawings Geometrical and Position Tolerance Tolerance Calculation Materials Science Strength of Materials Injection Molding Process Manufacturing Technologies	1 month Hours/day: 6
4	Basic know-how for Ansys simulations	Static simulations – snapper / clips / spring Thermal simulation Vibration simulation – modal / shock Steps: • Mesh done. • Simulation • Report + presentation	Faculty: Mechanical Faculty Year of study: III, IV Knowledge required: general technical knowledge / basic ProE - mandatory	Technical Drawings Geometrical and Position Tolerance Tolerance Calculation Materials Science Strength of Materials Injection Molding Process Manufacturing Technologies	1 month Hours/day: 6

Nr. crt.	Title	Description	Requirements	Tests	hours / day
5	Design parts/assembly of a Secondary Display	Design in Catia the following parts as 3D model +2D drawing: • Frame • Rear cover • Assembly If the Catia knowledge are not available, 1 week is needed for the basic training Catia.	Faculty: Mechanical Faculty Year of study: III, IV Knowledge required: general technical knowledge / Catia	Technical Drawings Geometrical and Position Tolerance Tolerance Calculation Materials Science Strength of Materials Injection Molding Process Manufacturing Technologies	1 month Hours/day: 6
6	Design parts of a HUD	Design in ProE the following parts as 3D model +2D drawing: • Motor-holder • Bearing • Screen • Top cover (acceptable only 3D model)	Faculty: Mechanical Faculty Year of study: III, IV Knowledge required: general technical knowledge / ProE	Technical Drawings Geometrical and Position Tolerance Tolerance Calculation Materials Science Strength of Materials Injection Molding Process Manufacturing Technologies	1 month Hours/day: 6
7	Basic software package for Volkswagen / Audi cluster instruments	Development of a basic SW package including: • Task scheduler • CAN communication driver • LCD driver • Stepper motor driver • LED control driver • I/O pins driver Activities • C development • Code debugging • Test on target • Code documentation using UML	Faculty: Automation & Computer Science, Informatics, Electronics Year of study: 3 or 4 Knowledge required: C / C++, microcontrollers, basic electronics, operating systems	C and microcontrollers	2-3 months Hours/day: 6-8
8	Common User Interface v1.2.0	Web application used to connect 2 change management systems.	Faculty: UPT, UVT – Information Science Year of study: 2-3 Knowledge required: Java EE, JSF, ADF framework (plus), Web Services (plus),	Java or C#	2 months Hours/day:6/8

Nr. crt.	Title	Description	Requirements	Tests	hours / day
9	BeagleBone Image Box - Touchscreen integration	We have the BeagleBone than we use now as Image Box, it would be interesting to have also the touchscreen part integrated for Central Display projects with touch screen. BeagleBone Black is a $45 MSRP community-supported development platform for developers and hobbyists. Boot Linux in under 10 seconds and get started on development in less than 5 minutes with just a single USB cable.	Faculty: Automation & Computer Science, Electronics & Telecommunication Year of study: 3 or 4 Knowledge required: - basic HW/uc knowledge - linux know how (configuration, programming) - C language	Electronics, microcontrollers, C	2 months Hours/day: 4/6/8
10	PSA LVDS-UART Tester	A software has to be developed on the Atmel placed on a deserializer board. This will be used to test the low level protocol for PSA LVDS bidirectional UART communication.	Faculty: Automation & Computer Science, Electronics & Telecommunication Year of study: 3 or 4 Knowledge required: - basic HW/uc knowledge - C language	Electronics, microcontrollers, C	2 months Hours/day: 4/6/8
11	Model Based Development 4 Truck Instrument Clusters	In our days, a truck it is a network of intelligent devices, controlling different parts of the truck. The instrument cluster communicates with all the other devices and provides information to the driver, being the main interface with the driver. This is why we are constantly challenged to develop simple to use but complex (as number of functionalities) instrument clusters. Model Based Development represent the next generation in SW Programming. Highly complex applications can be created in a visual and natural manner. Design, implementation and testing are done in a single environment, creating a very strong and useful real time tool. This approach reduces the project development time and offers the perfect environment for rapid prototyping, so you can immediately check and feel the output of your work. This is quite exciting when you develop applications that shows the Tire Pressure Information on a TFT display, compute the Fuel Consumption and Trip Information and shows them on the segmented display or calculates the Remaining Fuel and controls the dedicated stepper motor.	Faculty: AC, ETC Year of study: 2,3 Knowledge required: Matlab Simulink , uc, C (optional)	Matlab Simulink	2-3 months Hours/day: 4,6 or 8

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Nr. crt.	Title	Description	Requirements	Tests	hours / day
12	2D/3D Graphical Interface development using CGI Studio	In our days, a truck it is a network of intelligent devices, controlling different parts of the truck. The instrument cluster communicates with all the other devices and provides information to the driver, being the main interface with the driver. When center display is used, the information is displayed using 2D/3D graphical objects like bargraphs, icons or dynamic numbers or specific animations. An expert will show you how this is done on Instrument Cluster projects for manufacturers like IVECO or Hyundai. Then you have to: - analyze what graphical objects are usually needed for Instrument Clusters - define and implement generic graphical objects following our internal development process, in order to easily use them in new projects: http://www.fujitsu.com/emea/services/microelectronics/software/cgistudio/	Faculty: AC, ETC Year of study: 2,3 Knowledge required: - Basic knowledge of microcontrollers - Basic knowledge of OOP - Knowledge of Photoshop or similar tools is an advantage	Logical test, Embedded C test	2-3 months Hours/day: 4,6 or 8
13	Project request tool	Develop a WEB application tool that will be used to request new project creation for our customers. Functions: - Generate project unique identifiers - Create a report for existing projects - Send notification emails for project requests and for project creation Project managers should be able to fill in several fields, some of them are predefined. The Administrators will then approve/disapprove/process the requests and the tool will automatically generate a unique number for each project.	Faculty: Informatics, Computers Year of study: 3, 4 Knowledge required: HTML, CSS, ASP.NET	C#	3 months Hours/day: 6 hours/ day
14	S-parameters Processing Tool	Define a MATLAN based tool that can import standard s-parameter files and convert them to digital filter (FIR) coefficients compatible with Tektronix software.	Faculty: Electronics and Telecommunications Year of study: minimum 3rd Knowledge required: Signals and Systems, MATLAB, Maths (Laplace, Fourier)	HW Evaluation Test	4-6 weeks Hours/day: 6

Nr. crt.	Title	Description	Requirements	Tests	hours / day
15	SAP Electronics Assemblies Production Data Management	☐ Creation and maintenance of manufacturing data, drawings and documentation based on all the inputs received from Electrical and Layout Engineers ☐ Take into consideration and follow the Electrical Engineering process ☐ Creation and modification of production data based on Project Manager's requests ☐ Release in SAP of programmed devices by integrating SW with blank IC, create and release documents in SAP ☐ Involved in process definition and design guideline optimization As a SAP PDM Responsible, you will be involved in multiple projects with various customers.	Faculty: Electronics / Electrotechnics / Telecommunications Year of study: at least 3rd year Knowledge required: Layout CAD tools understanding (Zuken CR-5000 is an advantage), fluent English and/or German	HW Evaluation Test	3 months Hours/day: 4h/8h
16	Light Dimming Control	Develop an embedded application to control the dimming of multiple bulb types/LEDs according to the operating conditions of an Electronic Control Unit used in motor vehicles. The application must be able to take the input information from a knob/ potentiometer and generate a PWM at the output. The application must be able to detect the dimming sense and to take the appropriate action for the corresponding output.	Faculty: Computers and automation Year of study: 2nd or 3rd year Knowledge required: Basic uController knowledge, C, Analytical thinking, C# (optional)	C, Microcontrollers, C#	3 months Hours/day: 8
17	ATIC155_4L_B0	Support power supply testing	Faculty: ETC or AC Year of study: 2 or 3 Knowledge required: Basic electronics	Electronics	3 months Hours/day: 4

Nr. crt.	Title	Description	Requirements	Tests	hours / day
18	Embedded Test Software	'What is' ETS: Embedded SW used for Testing ECU HW in Manufacturing & Development. 'What is' a toolbox: a piece of binary code which is downloaded by the test-environment and executed by the kernel. Daily tasks: Requirements understanding. Write toolboxes to perform the specified tests. 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.	Faculty: Electronics, Automatics, Computer Science, Informatics Year of study: final year Knowledge required: Basic C programming language knowledge Basic knowledge of embedded systems, knowledge about microcontrollers English	C and microcontrollers	4 months Hours/day: 8
19	Evaluation of the magneto-resistive sensors in specific applications.	The magneto- sensors must be evaluated by testing of the behavior with different magnetic materials.	Faculty: Electronics Year of study: 2 or 3 Knowledge required: Basic electrotechnics, Basic electronics, Operational Amplifiers	Electronics	3 months Hours/day: 4
20	Parsing and manipulation of calibration data file	Currently there is no support to define multiple namings for the same data inside the calibration data file. The scope of this tool is to: -provide a user friendly interface -allow definition and storage of the multiple naming -> data relationship -look for the data inside the calibration data file -store the modified calibration data file so it can be used further The tool should be able to run in GUI mode (to allow data input) and command line mode to be integrated with the existing toolchain for the build process	Faculty: Automation and Computer Science Year of study: 2 or 3 Knowledge required: OOP (languages of choice: C#, JAVA, Python or Visual C++)	C, OOP	2 months Hours/day: 6

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Nr. crt.	Title	Description	Requirements	Tests	hours / day
21	NVMY (Non-volatile memory) space saving tool	The NVMY variables that are not actually used (initialized, saved or restored) should be removed from the NVMY structure, in order to free NVMY space for other needs. The tool could be integrated in TD4 platform, and could be run during SW build. It should search in all NVMY structures to detect if there are unused NVMY variables defined and create a log with these variables. The log can further be compared with the log resulted from the previous build (or integration step), to see if NVMY space can be saved by removing the unused NVMY variables. Possible extension of the tool: Check and grab all error logs for a certain aggregate from the log folders inside the PIS and create one single file relevant for that aggregate.	Faculty: Automation, Computer science, Electronics Year of study: 2 or 3 Knowledge required: Visual C++	Visual C++	4-8 weeks Hours/day: 6
22	ODX Flash Generator in Java	ODX Flash Generator is an application which is preparing the final files to be flashed using ODX(Open Diagnostic Data Exchange – ISO22901-1) standard format. The purpose of this project is to redesign the actual application	Faculty: Automatic and Computer Science, Informatics Year of study: 2 -> Knowledge required: Java	Java	3 months Hours/day: 6-8h
23	Verify electrical throttle actuator control model by simulation	The throttle component is the part of the intake air system that controls the amount of air flowing into the engine, in response to driver accelerator pedal. With electronic throttle control an electric motor is used for throttle actuation. The throttle position is determined by closed loop control algorithm: the goal is that the actual throttle position, calculated based on the sensor feedback signal, reaches the desired position requested by the intake air system within a certain time and with minimum admissible deviation. In this summer practice project a simulation model with the complete throttle actuator control strategy shall be built. This control model will be linked to the throttle actuator plant model. Test vectors shall be created in order to verify the model by simulation and evaluate the performance of the control algorithm.	Faculty: Automation and Computer Science Year of study: 1 or 2 Knowledge required: Matlab Simulink, System Controls	Matlab Simulink	2 months Hours/day: 6

Nr. crt.	Title	Description	Requirements	Tests	hours / day
24	Rework of display objects handling in Roadmap projects (target module DOF)	The DOF module (Display Output Functions) used in many projects is built on the multi-branching coding technique (i.e. switch-case, if-else). This reduces the code maintainability. A better approach is to use look-up tables that would contain also the different conditions needed to activate specific outputs. The final result would reduce the source code length a lot. The implementation must be validated with the module specific unit test. Activities • C development • Code debugging • Test on target	Faculty: Automation & Computer Science, Informatics, Electronics Year of study: 3 or 4 Knowledge required: C, operating systems	C and microcontrollers	6 weeks Hours/day: 4-6
25	Migrate Warping simulation GUI from GLUT to QT	A PC simulation used to validate the warping algorithms in the HUD projects currently has the GUI (Graphical User Interface) built on GLUT (an OpenGL based library). As this approach is deprecated in Windows based development environments there is a need to migrate the GUI to a more actual, still cross-platform technology. The proposal is to use QT for this. Activities • C++ development with QT in Windows environment • Code debugging	Faculty: Automation & Computer Science, Informatics, Electronics Year of study: 3 or 4 Knowledge required: C++ (mandatory), QT (experience with the QT technology is a plus)	C++ Language	2 months Hours/day: 6-8
26	Basic oscilloscope based on Raspberry Pi for SD projects	The idea would be to use an HW extension board for the R-Pi to sample low frequency signals (PWM, port outputs from runtime measurements) from the PCB and generate as output the waveforms. This output would be then used as video input for the SD. By this, we can check some system timings using directly the display without the need of an oscilloscope.	Faculty: Automation & Computer Science, Electronics & Telecommunication Year of study: 3 or 4 Knowledge required: Linux, serial protocols (UART, I2C, SPI), electronics	HW Evaluation Test	2 months Hours/day: 4/6/8

Nr. crt.	Title	Description	Requirements	Tests	hours / day
27	Integration portal for TSR projects	Currently for a running project a portal containing project related information exists. The idea is to setup such portals also for other projects.	Faculty: Automation & Computer Science, Informatics Year of study: 3 or 4 Knowledge required: HTML, Javascript, SQL Queries, Perl	C	4 weeks Hours/day: 6
28	PSA LVDS-UART Tester	A software has to be developed on the Atmel placed on a deserializer board. This will be used to test the low level protocol for PSA LVDS bidirectional UART communication.	Faculty: Automation & Computer Science, Electronics & Telecommunication Year of study: 3 or 4 Knowledge required: -basic HW/uc knowledge -C language	Electronics, microcontrollers, C	2 months Hours/day: 4/6/8
29	Binary Image Generator tool.	The scope of the project is to develop a tool which parses C files, creates a linker file, calls the compiler and linker, and generates a binary file. With a special download protocol, the binary file will be afterwards loaded into RAM of a microcontroller to be executed.	Faculty: Automation & Computer Science, Informatics, Electronics & Telecommunication Year of study: 3 or 4 Knowledge required: C++, C#, Perl	C++, C#	2 months Hours/day: 6
30	Reprogramming protocol for Cluster Instruments.	The scope of the project is to implement the Application Layer of a protocol able to flash memory devices present on a cluster instrument. The supported memory devices are: - internal flash memory of microcontroller - internal RAM memory of the microcontroller - external NOR flash memory on serial bus SPI The access to memory devices should be based on usage the existing software drivers for every memory device.	Faculty: Automation & Computer Science, Informatics, Electronics & Telecommunication Year of study: 3 or 4 Knowledge required: C , microcontrollers, basic electronics	C and microcontrollers	2 months Hours/day: 6/8

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Nr. crt.	Title	Description	Requirements	Tests	hours / day
31	Driver for accessing external serial flash memory on SPI	The scope of the project is to implement a driver which provides functions for accessing the external serial flash memory devices via SPI interface. The supported family memory devices are Spansion S25FL. The following functions have to be provided: - Read the device identifiers (auto-scan device type); - Read data from external serial flash memory device; - Activate/deactivate write protection; - Erase entire flash memory or by specified sector area; - Write data to external serial flash memory device;	Faculty: Automation & Computer Science, Informatics, Electronics & Telecommunication Year of study: 3 or 4 Knowledge required: C, microcontrollers (SPI interface), basic electronics	C and microcontrollers	2 months Hours/day: 6/8
32	Driver information environment	Development of a simulated driver environment using the following components: • Driver seat (with digital control) & non-reflective windshield • Audi color cluster instrument • Audi Head-Up Display • Driving wheel with digital controls • Driver pedals with digital control Activities • Development of a SW package for the cluster instrument, head-up display and the board controlling the driving wheel and pedals so that the driver is able to change parameters (e.g acceleration) which will be afterwards displayed on the cluster instrument & head-up display accordingly. • Code debugging on each unit • Test of each unit and the whole system.	Faculty: Automation & Computer Science, Informatics, Electronics Year of study: 3 or 4 Knowledge required: C / C++, microcontrollers, basic electronics, operating systems	C and microcontrollers	2-3 months Hours/day: 6-8

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Nr. crt.	Title	Description	Requirements	Tests	hours / day

33	Develop a Trip Computer Simulator for Hybrid cars	Modern car manufacturers are all producing (or planning to do so) hybrid cars. For these cars, the algorithms related to Trip Computer are not only interesting, but also quite a programming challenge.
		
		We would like to have a SW simulator to compute the main Trip Computer functionalities, base on the two tank approach of the hybrid cars.
		The task will be:
		- To understand the usual functionalities of the modern TCOs (like Avg Speed, Avg Consumption, Range and so on)
		- To get basic knowledge of the algorithms behind them
		- To get basic knowledge about Hybrid Cars
		- To implement a SW Simulation to compute all these items at a given moment, based on adjustable input values (like speed of the car, tank content, current consumption, type of fuel used at a given moment).
			Faculty: Automation & Computer Science, Informatics
			
			    Year of study: 3 or 4
			
			    Knowledge required: SW programming knowledge, C is preferred.
				C Language	2 months
					
					    Hours/day: 4 – 6 h/day

34	Self car diagnosis using mobile devices	The objective of this thesis is to design and implement a wireless communication system able to provide car diagnosis data to the user in order to detect functional missbehaviors.
		Steps:
		- Hardware design & implementation of wireless nodes using 16/32 bit microcontrollers
		- Adaptation to vehicle data bus (CAN / K-LINE)
		- Wireless communication protocol design and implementation in C
		- Visual application on mobile device (Android / OS X / other)
		- Documentation
			Faculty: Automation & Computer Science, Informatics
			
			    Year of study: 3 or 4
			
			    Knowledge required: C/C++, Basic electronics, Real-time OS, Computer architecture
				C, C++, microcontrollers	2 months
					
					    Hours/day: 4 – 6 h/day

35	Automatic Test Case Generation	The purpose of the project is to create an application that will generate test cases for the indications behaviors. The application will receive the Indication Table document as input and following some scenarios it will create test cases based on some rules. For each indication the following characteristics should be taken into consideration: message, icon/lamp and buzzer.	Faculty: Automation & Computer Science, Informatics
			
			    Year of study: 3 or 4
			
			    Knowledge required: C
				C	3 months
					
					Hours/day: 6h

Nr. crt.	Title	Description	Requirements	Tests	hours / day
36	Automatic collection of document status check for SPCC.	The tool will automatically collect the document status for all modules involved in a project version software delivery. Data shall be collected from the module documents stored in the Configuration Management tool, and reported for the SPCC. Also the tool shall collect as input all MRs delivered in a software delivery and check the document implementation for each affected module. The documents are stored and analyzed from the Configuration Management tool.	Faculty: Automation & Computer Science, Informatics Year of study: 3 or 4 Knowledge required: Java and/or Perl	Java	8-10 weeks Hours/day: 4-6h/day
37	Eclipse based application for integration of AUTOSAR SW	Autosar standard is used in all Electronic Control Units distributed in the car. The software is split in 2 parts: Applicative and Basic. The basic part is developed according with AUTOSAR standard. The integration of the Basic software is facilitated by applications developed based on Eclipse framework. The theme is to develop an application based on Eclipse used for the integration of AUTOSAR SW in the real customer project. You will implement an application in Java language through all SW development steps: requirements, design, coding and testing. For your daily work you have to work with professional SW development tools based on Eclipse.	Faculty: Computer Science, Automation, Electronics and Telecommunications Year of study: 3rd year Knowledge required: Java knowledge and XML	Java	2 month Hours/day: 4h/day

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Nr. crt.	Title	Description	Requirements	Tests	hours / day
38	Fluent EMF API	The goal is to create a fluent API for the Eclipse Modeling Framework (EMF) to be integrated in a large Eclipse-based application. A fluent API for EMF would greatly ease the programmatic creation of EMF objects. For a short introduction to EMF, see: http://www.vogella.com/tutorials/EclipseEMF/article.html As a starting point for defining a fluent API for EMF, consider this implementation: https://github.com/siamak-haschemi/EMF-Builder-Generator available also through the Eclipse Marketplace here: http://marketplace.eclipse.org/content/emf-builder-generator-ebg#.UwdiyYXzJkc It could be as simple as adapting it to work with the version of Eclipse required for our application (Eclipse 3.8.2 at the moment). Further tailoring of the generated API might be required, based on the user feedback (mainly, the M2M team). For an introduction to designing fluent APIs, see: http://martinfowler.com/bliki/FluentInterface.html http://martinfowler.com/bliki/ExpressionBuilder.html	Faculty: Computer Science, Automation, Electronics and Telecommunications Year of study: 3rd year Knowledge required: Java knowledge	Java	2 months Hours/day: 4h/day
39	Generate configurable project reports	When working on projects involving more than 60 peoples, tracking of the work progress on teams and individuals became harder and harder without a proper project reports. The tracking tools used in our project are built on Access platform or Oracle/Java platform. The output of this summer practice project is: • Understanding existing Database structure • Create configurable SQL queries for getting the reports • Creating project reports for individual estimated and real effort • Creating project reports for individual rework effort • Creating project reports for teams estimated and rework effort	Faculty: • UPT/UVT – Automatica si Calculatoare Year of study: • graduated at least 2nd year Knowledge required: • Basic computer programming knowledge • Database knowledge • SQL • Access • Oracle	Visual C, C++	3 months Hours/day: 4h / 6h / 8h

Nr. crt.	Title	Description	Requirements	Tests	hours / day
40	Automated tests development (JScript) for ADAS Data Acquisition and Validation framework	Develop automated tests in JScript using the TestComplete framework, for a complex PC Software Application (MTS – Data Acquisition, Test and Validation for ADAS camera and radar sensors) Knowledge that will be acquired by student: • Programming: JScript, OOP • General ADAS Data Acquisition and Validation knowledge • SW Development lifecycle - Tests & Requirements management	Faculty: Computer science related Faculty Year of study: 1 + Knowledge required: Computer science related Faculty, Capacity to understand and to work with a complex SW Application, Basic knowledge for OOP & JScript (or a similar programming language)	Java and C++	3 - 6 months Hours/day: 4-6-8h/day
41	Disassembly database	Database that can be used for tracking disassembly activities. Main specifications: ⬜ Easy to use ⬜ User friendly ⬜ Easy to input data ⬜ Able to extract data from the database ⬜ Able to extract/compile various charts ⬜ Adjustable for different products	Faculty: UPT (ET, AC, ETC, Mecanics, MPT), UVT(Informatics, Mathematics, Physics) Year of study: 1-3 Knowledge required: Programming in various software	Programming	3 month Hours/day: 3-4/day
42	Lessons learned database	Database that can be used to input lessons learned. Main specifications: ⬜ Easy to use ⬜ User friendly ⬜ Easy to input data ⬜ Able to extract data from the database ⬜ Able to extract/compile various charts	Faculty: UPT (ET, AC, ETC, Mecanics, MPT), UVT(nformatics, Mathematics, Physics) Year of study: 1-3 Knowledge required: Programming in various software	Programming	3 month Hours/day: 3-4/day
43	MLB intelligent Test Bench	Perform HW activities (learn how to read schematics, configurations, block schematic, etc) Perform virtual measurement using Labview Perform technician task for electrical activities, PCB assembly, measurements, calibration, testing, etc Flash and verify modules Perform mechanical task for build up boxes,	Faculty: ETC Year of study: 2-3 Knowledge required: operate PC, how to solder wires, components, practical abilities	HW	3 months Hours/day: 4-8

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Nr. crt.	Title	Description	Requirements	Tests	hours / day
44	Digital Communications on polymorphic hardware	Implement several hardware communication protocols in a hardware description language (Verilog, VHDL) using FPGA. The purpose is to implement several IP Core controllers that communicate on the same physical lines.	Faculty: AC, ETC Year of study: 2, 3 Knowledge required: HDL design, digital logic	HW	10 weeks Hours/day: 6-8h
45	Implementation of GDB server for a JTAG debugger.	Implementation of a GDB server (GNU debugger) for PEEDI (Power Embedded Ethernet Debug Interface). The project consists of implementing the interpretation of the gdb client commands received on a network socket, and transformation of those commands into ones for the PEEDI sent/received on a network socket. The following knowledge requirements are considered to be a plus: • socket programming • file manipulation • unix pipes • C or Java programming	Faculty: Computer Science, Electronics, Electrical Year of study: 2-3 Knowledge required: C or Java programming	C, JAVA	10 weeks Hours/day: 6-8
46	ICC protocol simulator	Create an application that simulates the behaviour of a device on a proprietary communication bus. This application shall be able to extract the data transmited on the bus and based on the content shall trigger the corresponding actions (sending another message / echoing the incoming messages). Also needs to detect timeouts, missing messages, incorrect / incomplete messages, etc.	Faculty: Computer Science, Electronics, Electrical Year of study: 2-3 Knowledge required: C programming, Java	C, JAVA	10 weeks Hours/day: 6-8
47	ICC Serial sniffer	Create an application that analizes the raw data on the serial line, by interpreting a proprietary protocol implementation (ICC inter controller communication). This application shall be able to extract packages, timestamps, direction, etc and display them in a nice form on the PC. Also it should be able to make a log file for an extended amount of time (save on HDD).	Faculty: Computer Science, Electronics, Electrical Year of study: 2-3 Knowledge required: C programming, Java	C, JAVA	10 weeks Hours/day: 6-8

Nr. crt.	Title	Description	Requirements	Tests	hours / day
48	Version management helper tool	Implement an application for Windows 7+ with a graphical user interface that handles merging activities using several script files that communicate with the version management tool. The application should provide a simple GUI to use and it should handle file navigation, open outside applications, generating reports. Experience with GUI would be a plus.	Faculty: Computer Science, Automatics, Electronics, Telecommunications Year of study: any Knowledge required: Java Swing or Visual C# or Visual C++	Java	10 weeks Hours/day: 6-8
49	Multimedia system for PSA (Peugeot and Citroen)	We develop embedded systems according to the processes and methods of the automotive industry. Mainly Radio functionality, everything related to FM/AM/DAB handling. We currently need to develop test specifications for different type of functionalities and use both programming skills and electronics know-how in order to create the right test environment	Faculty: Politehnica University: Automation and Computer Science Faculty Year of study: 1st, 2nd Knowledge required: Good electronics knowledge Usage of oscilloscopes, power supplies Fluency in English	HW and C++	2 months Hours/day: 4-6
50	Height measurement based on ultrasonic technology	Develop and test SW capable to measure the height of an air spring, under different pressure and temperature conditions	Faculty: Computer science, Informatics, Electronics, Electrotechnics, Physics Year of study: Graduation year Knowledge required: C programming language, microcontrollers (ATMega8), electronics, physics	C and microcontrollers	3 months Hours/day: minimum 4 h

Nr. crt.	Title	Description	Requirements	Tests	hours / day
51	Tool for static code analysis for AUTOSAR SW	Autosar standard is used in all Electronic Control Units distributed in the car. The software is split in 2 parts: Applicative and Basic. The basic part is developed according with AUTOSAR standard. The integration of the Basic software is facilitated by applications developed based on Eclipse framework. The theme is to develop a tool for analyzing the public APIs from a Basic software part based on project specific configuration. The goal is to generate stub files and test cases for automated testing. You will implement an application in Python or Java language through all SW development steps: requirements, design, coding and testing. For your daily work you have to work with professional SW development tools (Python or Eclipse).	Faculty: Computer Science, Automation, Electronics and Telecommunications Year of study: 3rd year Knowledge required: XML, Python or Java knowledge	Java	2 months 4h/day

52	Display matrix panel	the purpose of the project is to design and build a matrix of 4x4 LCD's and to split the image source so that it's showed on the hole matrix instead of on a single display
		- the image / picture should be read from an SD card and split in 4x4 pieces that will be sent to each display separately to recompose the picture
		- hardware students will have to develop the block diagram, schematic and layout of the PCB, and finally assemble the components;
		- software students should write the algorithm for processing the picture and also the synchronization between the LCD's
		- mechanical students should design and build a frame that will support the 16 displays and also the interconnection harness
		- all students will get knowledge in the field of automotive LCD's, video interfaces and specific challenges of the automotive environment
			Faculty: ETC, AC, ET
			   Year of study: 1, 2 or 3
			   Knowledge require basic knowledge in embedded programming, C programming
				C and microcontrollers	3 months
					
					Hours/day: 8

Nr. crt.	Title	Description	Requirements	Tests	hours / day
53	Display matrix panel	the purpose of the project is to design and build a matrix of 4x4 LCD's and to split the image source so that it's showed on the hole matrix instead of on a single display - the image / picture should be read from an SD card and split in 4x4 pieces that will be sent to each display separately to recompose the picture - hardware students will have to develop the block diagram, schematic and layout of the PCB, and finally assemble the components; - software students should write the algorithm for processing the picture and also the synchronization between the LCD's - mechanical students should design and build a frame that will support the 16 displays and also the interconnection harness - all students will get knowledge in the field of automotive LCD's, video interfaces and specific challenges of the automotive environment	Faculty: ETC, AC, ET Year of study: 1, 2 or 3 Knowledge required: - basic knowledge of analog and digital electronics, ECAD environment	HW	3 months Hours/day: 8
54	Display matrix panel	the purpose of the project is to design and build a matrix of 4x4 LCD's and to split the image source so that it's showed on the hole matrix instead of on a single display - the image / picture should be read from an SD card and split in 4x4 pieces that will be sent to each display separately to recompose the picture - hardware students will have to develop the block diagram, schematic and layout of the PCB, and finally assemble the components; - software students should write the algorithm for processing the picture and also the synchronization between the LCD's - mechanical students should design and build a frame that will support the 16 displays and also the interconnection harness - all students will get knowledge in the field of automotive LCD's, video interfaces and specific challenges of the automotive environment	Faculty: Mechanics Year of study: 1, 2 or 3 Knowledge required: - Mechanics: basic knowledge of mechanical design, MCAD (ProE or Catia V5)	MD	3 months Hours/day: 8

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Nr. crt.	Title	Description	Requirements	Tests	hours / day
55	Eclipse plug-ins to access the Requirements Management Tool	RM Tool: Rational DOORS 9.5 Eclipse: custom IDE based on the Rich Client Application Platform Two plug-ins are needed: a) Import to DOORS: the information is extracted from the an XML database as specified by the project requirements; the information is passed to DOORS for import b) Export from DOORS: the previously imported information receives unique DOORS ID's that need to be imported back to the database and mapped to the XML source elements	Faculty: Computer Science / Informatics Year of study: 2 or above Knowledge required: XML and XSL standards; OO programming; Java; Eclipse IDE; general DB knowledge; Logic; Ability to read, understand and follow a basic set of requirements	Java	1 month Hours/day: 4-6 h/day
56	SQLite Database management	The project requires to: - read data from an SQLite database - interpret the data using the logic from a secondary application - perform a series of small algorithms in order to detect : o status of certain objects o missing sub-elements for certain objects o statistics over the existing database : complete / incomplete objects o other small custom tasks - auto - complete the missing data for certain objects using the logic from a secondary application. The project requires also a simple UI.	Faculty: Computer Science, Informatics Year of study: >= 2 Knowledge required: SQL / .NET / Algorithms / Logic / Graphical User Interfaces / Threading / Ability to read, understand and follow a basic set of requirements.	C#	1 month Hours/day: 4-6 hours
57	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.	Faculty: Automatica si Calculatoare Year of study: 2-3 Knowledge required: C, microcontrollers	C and microcontrollers	10 weeks Hours/day: 8

Nr. crt.	Title	Description	Requirements	Tests	hours / day
58	Advanced module for engine control unit testing	This software package will be developed for Automation Test Box, and have to handle the following: - CAN communication for configuration - up to 64 DCM frequency inputs - up to 100 PWM frequency output. - DIP/DOP control. - up to 8 voltage adjusted channel controlled by DAC - repeater cells for CAN/LIN/FlexRay. - commands core for configuration. - one CRK and two CAM signals generation. The system is base on 2xTc27xx microcontroller (multi-core architecture) and FPGA dedicated for engine injection/ignition signal generation.	Faculty: Computer Science / Automation / Electronic Year of study: III Knowledge required: ANSI C knowledge , 32bit architecture microcontrollers, Digital electronic knowledge.	C, C#, microcontrollers	3 months Hours/day: 6-8 hours
59	CAM and CRK generator (electronic and GUI)	This device will be built round FPGA (Spartan 6) having the following characteristics: • Tooth period(dependent on RPM)); it shall be linked to RPM and total number of CRK teeth per CRK rotation • Minimum tooth period: 83.33us(tooth period at 10000RPM when number of CRK teeth is 72) • Maximum tooth period: 2.5s(tooth period at 1 RPM when number of CRK teeth is 24) • CRK active edge • Number of CRK teeth per CRK rotation; typical values: 60 teeth, 40 teeth, 36 teeth, 24 teeth; generic support for any value staring at 16 teeth and up to 72 teeth is intended • Number of missing teeth per CRK GAP; typical values: 1, 2, 3, 4; • Number of GAPs per CRK rotation; typical values: 1, 2, 3; generic support for up to 4 GAPs per CRK rotation is intended • CRK pulse types(see next paragraphs)	Faculty: Computer Science / Automation / Electronic Year of study: III Knowledge required: ANSI C knowledge , 32bit architecture microcontrollers, Digital electronic knowledge, VHDL language.	C, C#, microcontrollers	3 months Hours/day: 6/8 No of students: 1 or 2
60	Communication bridge – FlexRay to CAN to LIN to USB	This device is able to create a communication bridge between two type of communication busses. The following communication busses could be take into account: CAN(500KB), CAN(1M), FlexRay, LIN(19200), LIN(9600), USB. The link between two busses could be done by configuration via USB.	Faculty: Computer Science / Automation / Electronic Year of study: III Knowledge required: ANSI C knowledge , 32bit architecture microcontrollers, Digital electronic knowledge, VHDL language.	C, C#, microcontrollers	3 months Hours/day: 6/8 No of students: 1 or 2

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Nr. crt.	Title	Description	Requirements	Tests	hours / day
61	Display content converter tool	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: The internal display Video RAM memory can be read via diagnostic services. The read memory represents the internal display representation of what exactly is drawn on the display. The format for the internal memory is specified by the supplier. A tool must be created to read the Video Ram memory area and convert it into a standard format (bmp, png, etc) which can be later on checked on the PC side. Both above variants must be supported: Dot matrix and TFT.	Faculty: technical university (ETC, AC) Year of study: 2, 3, 4 Knowledge required: C, C++, C#, XML language, basic embedded knowledge, CAN	C, C++	3 months Hours/day: 4,6h
62	Signal interpreter plugin	Logic analyzers are used in the daily work in the Low Level Embedded area for analyzing different communication protocols (I2C, CAN, UART, etc). The logic analyzer used in the I CV&AM Low Level team comes with a standard GUI that has a set of predefined signal interpreters included. Project proposal: As an extension to the provided signal interpreters, a library containing signal processing methods can be done as plugins. Specific Continental protocol (InterControllerCommunication) and other signal processors (e.g. PWM) need to be implemented in order to be used in the logic analyzer GUI.	Faculty: technical university (ETC, AC) Year of study: 2, 3, 4 Knowledge required: C++, C#, XML language, basic embedded knowledge (signals, communication protocols)	C++, embedded.	3 months Hours/day: 4,6h
63	Matlab Simulink automotive blocks simulation & test	Matlab Simulink is used as an application environment for Model Based Development. As part of the Matlab Simulink module library provided for application development, a set of automotive specific blocks are provided. Project proposal: Blocks provided in the automotive blockset must be simulated in order to cover the blocks unit testing. Test specification and execution must be provided Continental development process.	Faculty: technical university (ETC, AC) Year of study: 2, 3, 4 Knowledge required: Matlab Simulink, other Modelling language.	Matlab	3 months Hours/day: 4,6h

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Nr. crt.	Title	Description	Requirements	Tests	hours / day
64	BLDC and DC motor performance testing.	The project consists in studying and understanding of project specification relative to the TCU (Transmission Control Unit) electrical tests, BLDC and DC motor functionality and TCU functionality.	Faculty: technical university (ETC, AC) Year of study: 3, 4 Knowledge required:Understanding of test specification, TCU functionality, testing knowledge.	HW	3 months Hours/day: 6-8h
65	Research on innovative functions for Highly Automated Driving by adapting a Prototype Vehicle equipped with ADAS sensors.	Integrate new interfaces (WiFi, GSM) for transferring vehicle information, and for receiving detailed mapping data. Design and integrate the Gateways, have the system running, define a system test plan and run system tests for these new interfaces. Document the design and complete the test reports. The above activities will be performed with support from engineers from ADAS Business Unit. The student will have the opportunity to learn about ADAS systems: how they work and their functions(LDW, ACC, TSR, etc).	Faculty: Electronics, Telecommunications, Computer Science Year of study: at least 2nd Knowledge required: basic Electronics designing, Programming (C++ and MathLab are a plus)	HW test, SW test (C or C++).	3 months Hours/day: 8h
66	Client Backup Service	Project for providing a worldwide, optional, chargeable service for the secure client backup of local data for standard clients.	Faculty: UVT/UPT Year of study: any Knowledge required: IT Infrastructure skills – Networking, Active Directory, Software Installation, Windows 7 OS	IT	3 months Hours/day: 6h
67	Design of Transmission a Control Unit	Mechanical Design a Transmission Control Unit	Faculty: Mechanics Year of study: last (4) Knowledge required: MD test should be pass	MD	4-8 weeks Hours/day:

Nr. crt.	Title	Description	Requirements	Tests	hours / day
68	Tool for automatically generated output analysis based on traceing input	Extend existing tool which allows pre-analysis of a specific format of trace output The tool currently generates reports in Excel Error handling needs to be added Generalization needed to support different input formats (e.g. DLT, output from other automated scripts) The tool has 2 parts: one written in Java, the other one in Excel/VBA	Faculty: Computer Science Year of study: 2-3 Knowledge required: Java, Excel/VBA	Java	2 months/1 student OR 1 month/2 students Hours/day: 6-8
69	Trace Analyzer tool improvement	New implementations are requested for Trace Analyzer Tools Trace Analyzer is a tool used for collecting traces (reads output from serial, network) and permits offline analysis of traces, filtering and graphic representation Coaching will be provided to support the project	Faculty: Computer Science UPT/ UVT Informatics Year of study: 2-3 Knowledge required: C++/C# , English	C++/C#	2-3 month Hours/day: 4-6 h
70	Script development for measuring % of code that is covered by design	Output of tool is a log file which contains the design coverage for - Existing code - New code - Modified code Generic implementation is needed to be used for several projects Coaching will be provided to support the project	Faculty: AC UPT/ UVT Informatics Year of study: 2-3 Knowledge required: Scripting Perl/Python, xls/ Visual Basic Script, C++/C#, English Knowledge +: Rhapsody	C++ , Visual Basic is optional	2-3 month Hours/day: 4-6 h
71	Module SW development for embedded transmission system	Requirements analysis, design concept, coding in C language and integration in a complete project.	Faculty: Computer Science, Automation, Electronics and Telecommunications Year of study: III Knowledge required: ANSI C knowledge , 32bit architecture microcontrollers, Digital electronic knowledge, VHDL language.	C and microcontrollers	2-3 month Hours/day: 6 h

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Nr. crt.	Title	Description	Requirements	Tests	hours / day
72	MATLAB Test Application	Develop an application in MATLAB (M scripts / function) that will be used to test functionalities created in Simulink. As result reports will be automatically generated.	Faculty: Computer science, Informatics, Electronics, Electrotechnics Year of study: Graduation year Knowledge required: C programming language, MATLAB, Simulink	MATLAB	3 months Hours/day: minimum 4 h
73	Advanced PowerPC I/O module	Project is based on a 32-bit PowerPC microcontroller platform with multiple configurable input/output ports. An application must be designed which is able to control different signals (e.g. frequency measurement/generation) based on input received over CAN messages. The application will be controlled over CAN using CANape software. Scope: development of generic automated I/O tests.	Faculty: Technical University (AC, ETC, etc.) Year of study: 2nd year, 3rd year is a plus Knowledge required: C programming, microcontroller knowledge	C and microcontrollers	3 months Hours/day: 6h/day
74	Advanced CAN Bootloader, with diagnosis support, for Freescale HCS08 microcontroller family	The projects goal is to create a complex CAN bootloader program for the HCS08 microcontroller family. The project will consist of 4 steps: 1. Implementation of a flash driver for HCS08 devices internal flash 2. Implementation of a CAN driver for HCS08 devices 3. Integration of CAN driver and flash driver into the UDS, KWP2000 and XCP protocols 4. Creating PC test application and testing of the flash bootloader program	Faculty: Technical University (AC, ETC, etc.) Year of study: 2nd year, 3rd year is a plus Knowledge required: C programming, microcontroller knowledge	Faculty: Technical University (AC, ETC, etc.) Year of study: 2nd year, 3rd year is a plus Knowledge required: C programming, microcontroller knowledge	3 months Hours/day: 6h/day

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Nr. crt.	Title	Description	Requirements	Tests	hours / day
75	Instrument cluster test application development	Develop a logiCAD model application integrating all the features of an instrument cluster project and a CANoe simulation that will command requests and evaluate incoming responses from instrument cluster in order to automate as much possible the functional testing part. Main tasks: - Understand the instrument cluster project requirements and develop logiCAD application in a model based development framework - Understand the features available in Vector CANoe tool and develop a CANoe simulation by integrating different features test cases (e.g. coding parts in CAPL is required - specific programming language, similar to C)	Faculty: Technical university (UPT / UVT) Year of study: >2 Knowledge required: C, Embedded systems / microcontrollers	C, OOP	3 months Hours/day: 8
76	Embedded system sound simulator	Extend the features set of the tool used for simulating on PC the sound generated by an Instrument Cluster (Dashboard). Main features: 1. GUI with "Import" functionality to load wav type file/sound 2. Convert imported data to SGO type sound (apply limitations to frequency, tones, amplitude, etc. to match the capabilities of the embedded system) 3. GUI with "play" – "stop" – "pause" buttons to output the SGO type sound to the PC speakers 4. GUI that represents in an easy and intuitive graphical form the SGO sound with possibility to manipulate the sound configuration 5. "Export" functionality to output SGO type sound into SOUND driver specific c-code data	Faculty: Technical university (UPT / UVT) Year of study: >2 Knowledge required: C, OOP (C#), Embedded systems / microcontrollers is a plus	C, C#	3 months Hours/day: 8

Nr. crt.	Title	Description	Requirements	Tests	hours / day

77	Memory Map	Extend capabilities of the memory map tool to access projects database server for storing memory analyzer data (e.g. software subsystems RAM/ROM requirements) as reference for new starting projects.
		
		Main features:
		- The "Linker Settings" part allows the user to define in a graphical interface the areas, sections, options required for project linker settings and save to an output file. It also provides the possibility to load a previous generated linker settings file and update configuration, extend according to project needs.
		- The "Memory Analyzer" part gives an overview of the project RAM/ROM requirements as in total available, allocated, used, gaps and free memory by analyzing project files mp1, mpm, mps.
			Faculty: Technical university (UPT / UVT)
			
			   Year of study: >2
			
			   Knowledge required: C, OOP (C#), Embedded systems / microcontrollers is a plus
				C, C#	3 months
					
					Hours/day: 8

78	CAN VN1630 IO Port Usage for BCM Testing Purposes	• Develop CANoe configuration with the following goals: o Drive output ports of VN1630 IO o Read inputs ports of VN1630 IO o Use the read/write capabilities to implement test vectors o Use CANoe Test Environment o Encapsulate the implementation so it can be easily included in any CANoe configuration • Contribute to HW definition – a small HW construct is necessary in order to attach the PC test environment to the BCMs IO	Faculty: Calculatoare Year of study: 2-3 Knowledge required: ANSI C -advanced, CAN knowledge – basic, HW knowledge - basic	ANSI C, Embedded SW/ Microcontrollers	1 month Hours/day: 6h
79	CANoe LIN TPMS Wheel Unit Communication	• Develop CANoe configuration for TPMS BCM Integration purposes with the following goals: o All wheel unit signals can be changed by panel o TPMS virtual behavior (wheel spinning in panel with link to vehicle speed information o Automatic update of the LIN data transmitted to the BCM including automatic polynomial CRC calculation o Integerate Diag Status information in a CANoe based status panel o Posibility to Trigger auto learning of the wheels	Faculty: Calculatoare Year of study: 2-3 Knowledge required: ANSI C -advanced, CAN knowledge – basic, LIN knowledge – basic	ANSI C, Embedded SW/ Microcontrollers	1 month Hours/day: 6h