

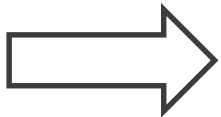
RENESAS SYNERGY™

READY-TO-USE LECTURE MATERIALS
FOR GRADUATES

INTRODUCTION

RENESAS SYNERGY

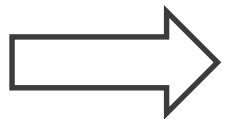
- As microcontrollers increase in complexity, so does the breadth of knowledge required to make them operate in the desired way.
- The Synergy Software Package (SSP) is a software package that is provided to users for the purpose of allowing them to start their development at a higher level than they have in the past.
- This does not mean hiding every complexity, but instead presenting it to the user in a way that is easily understandable, and quickly modifiable. Instead of requiring the user to refer to a hardware register at every step, we may instead offer them a well-documented function call.



Make the engineer work at a very high level with focus on application

RENESAS SYNERGY

- Make the engineer work at a very high level with focus on application
- This target of the SSP is reasonable for engineers with experience in application development and embedded systems
- For students with little or no knowledge in embedded systems, application development, microcontroller systems... it will be difficult to get the picture just from a top view



Start at the bottom, experience the need for higher level components and finally understand the whole solution package called Renesas Synergy Platform

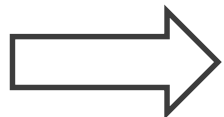
ABOUT THE LECTURE

- The course is planned for one term – about 12 weeks with 4 lessons per week
- Target group for this lecture material: End of bachelor or master level of electrical engineering or similar
- Prerequisites: (Basic) knowledge of microcontrollers and embedded programming, e.g. C
- Complete lecture material in English
- The course material consists of
 - Slides for the lecture
 - Lab booklet in line with the lecture, based on S7G2 Starter Kit
- Content of the lecture is an introduction and hands-on lab to Renesas Synergy Platform

ABOUT THE LECTURE

- Even though the basic idea of the Renesas Synergy Platform is a top view approach, this course material follows a bottom-up approach to finally reach the Renesas Synergy Platform solution
 - Start at the HW and the development environment
 - Introduction of needed software components like board support package or HAL
 - Real time operating systems
 - Renesas Synergy Platform

- Benefits of the bottom-up approach for the students
 - Learn about the hardware and software components of embedded systems
 - Get an insight into the complexity of embedded system development
 - Experience the need for ready-to-use solutions like BSP, HAL, ...
 - Use a platform solution like Renesas Synergy Platform to focus on application



Final target: Focus on application, but understand the underlying system

ABOUT THE COURSE MATERIAL

- Course material is subdivided into sections
 - 11 sets of slides covering the different topics
 - Each part starts with a short general introduction into the topic
 - Afterwards the solution from the Renesas Synergy platform is presented
 - The lab fits to the lecture and ends in the realization of an own application
- This procedure provides a high degree of flexibility for the lecture and the lecturer
 - Select the parts needed depending on the previous knowledge of the students
 - Adopt the order of the parts
 - Even a top-down approach is still possible if fitting better to the own course's needs
 - Adapt the contents to the needs of the course, e.g. skip the general introduction to a part
 - Flexible split of theory and lab work, focus on lecture or lab

CONTENT OF THE COURSE MATERIAL

- 1) IoT & Industry 4.0
- 2) μ C
- 3) Starter Kits
- 4) Integrated Solution Development Environment (ISDE)
- 5) Board Support Package (BSP)
- 6) Hardware Abstraction Layer (HAL)
- 7) Real-Time Operating System (RTOS)
- 8) Framework and Functional Libraries
- 9) Middleware
- 10) Connectivity
- 11) Synergy Platform

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