

# RENESAS SYNERGY™

## READY TO USE LECTURE MATERIALS FOR GRADUATES

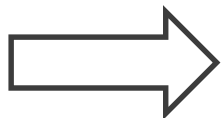
INTRODUCTION

RENESAS *synergy*™

# RENESAS SYNERGY

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- 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

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- **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

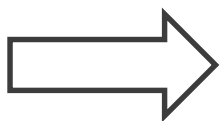
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- The course is planned for one term
  - About 12 weeks with 4 lessons per week
- Target group for this lecture material
  - End of bachelor or master level of electrical engineering or similar
- Prerequisites
  - (Basic) knowledge of microcontroller 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

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- Even though the basic idea of 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

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- **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

# ABOUT THE COURSE MATERIAL

## CONTENT OF THE COURSE MATERIAL

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- 1) IoT & Industry 4.0
- 2)  $\mu$ 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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