



RTU Course "Digital Techniques Electronic Instrument Systems (Study Project)"

15E02 Avionikas katedra

General data

Code	TAA215
Course title	Digital Techniques Electronic Instrument Systems (Study Project)
Course status in the programme	Compulsory/Courses of Limited Choice
Course level	Undergraduate Studies
Course type	Professional
Field of study	Transport
Responsible instructor	Smirnovs Igors
Academic staff	Šļenska Nina Žukovska Jekaterīna
Volume of the course: parts and credits points	1 part, 2.0 Credit Points, 3.0 ECTS credits
Language of instruction	LV, RU
Possibility of distance learning	Not planned
Abstract	The course project is intended to design a digital device that realizes the logical answer to the function. It is necessary to develop the digital device functional circuitry and principles, as well as printed assemblies. The developed device capacity is required to verify with the simulation or the practical realizing. The project is also intended for a specific digital avionics device function and performance analysis algorithm.
Goals and objectives of the course in terms of competences and skills	Apply theoretical knowledge of the subject "Digital Techniques Electronic Instrument Systems" first parts and update one's work with technical literature, be able to develop a logical digital device assigned with the algorithm using simulation programs. Be able to analyze the specific aircraft avionic device functions and algorithm of the operations.
Structure and tasks of independent studies	Individual work with the technical literature and simulation programs.
Recommended literature	1. J. Greivulis, I. Raņķis. Iekārto vadības elektroniskie elementi un mezgli. Rīga: Avots, 2004, 288 lpp. 2. Опадчий Ю.Ф. и др. Аналоговая и цифровая электроника. Москва: Горячая линия-Телеком. 2002, 768 стр. 3. Ю. Угрюмов. Цифровая схемотехника. Санкт Петербург, "БХВ - Петербург", 2004, 518 стр. 4. Н. Бабич, И. Жуков. Компьютерная схемотехника. Методы построения и проектирования, Киев, "МК-Пресс", 2004, 575 стр. 5. Civil Avionics Systems. I. Moir, A. Seabridge, 2002, 416 p.
Course prerequisites	Electronic, digital techniques electronic instrument systems.

Course outline

Theme	Hours
Composition of value tables for the synthesized device switching function.	1
Logical algebras function representation.	3
Logical algebras function minimization.	6
Logical algebras function minimization for the system.	4
Optimized system simulation.	2
Optimized system simulation on the base of real components.	4
Synthesized device typed assembly drafting.	4
Avionics equipment (the system) digital assembly task and working principle description.	4
The results presentation.	4

Learning outcomes and assessment

Learning outcomes	Assessment methods
1st stage: synthesizing device switching function composition and minimization. Logic algebra functions minimizing the entire system.	40% of volume and quality assessment.
2nd stage: optimized system simulation.	60% of volume and quality assessment.
3rd stage: synthesizing device printed assembly design.	75% of volume and quality assessment.
4th stage: avionics equipment (the system) digital assembly task and working principle.	90% of volume and quality assessment.
Project pre defence.	Must be 100% preparedness.

Study subject structure

Part	CP	ECTS	Hours per Week			Tests		
			Lectures	Practical	Lab.	Test	Exam	Work
1.	2.0	3.0	0.0	2.0	0.0			*