Module Descriptions ISP
Faculty of Engineering

Contents

Electrical Engineering

Mobile Communications			
ECTS Points	3	**Graded**	Yes
Workload in hours	Total: 86 Mandatory attendance: 36 Independent study: 50		
Course description	Fundamentals of Mobile Communications: Wave Propagation and Description of Mobile Radio Channels - Free Space Propagation - Multiple Propagation and Propagation Effects (Reflection, Scattering, Diffraction) - Fading - Radio Channel: Frequency Selectivity, Time Variance and Parameters - Doppler Effect - Basics of MIMO - Wave Propagation along Railroad Tracks - Modeling of Mobile Radio Channels (Channel Models) - Calculating with Decibels - Radio Network Planning Fundamentals - Link Budgets Physical Layer in Mobile Radio Networks - Introduction to a Transmission Standard, e.g. GSM (Services, Functions, Design, Multiple Access) - History and Transmission Standard Differences - Physical Layer in the OSI Layer Model (e.g. Logical Channels, Physical Channels) - Typical System Designs with regards to Source Coding, Channel Coding, Interleaving, Modulation, etc. Network Architecture of a Transmission Standard (e.g. GSM) Mobility in diverse Radio Networks Security Aspects in Mobile Networks		
Aims and skills	**PROFESSIONAL COMPETENCY** Upon completion of the module, students will have - in-depth knowledge of mobile communication systems - sound fundamentals for application areas of Internet services, Mobile Communication and System Design **METHODOLOGICAL COMPETENCY** Upon completion of the module, students will have acquired the competence to, - work independently on mobile application issues as well as on Internet applications and services - independently delve deeper into issues concerning design and planning of communication systems (analyzing and, if necessary, expanding communication protocols, dimensioning, assessing and further developing radio channels,...) - exchange ideas on a scientific level with experts on technical questions and tasks in the field of the above-mentioned application areas **COMPREHENSIVE ACTION COMPETENCY**		

	Students have acquired the competence to - identify use cases from the field of complex communication systems, evaluate them on a case-by-case basis and develop them further in the context of the application - apply acquired basics and methods in other fields of application
Prerequisites	None
Assessment	Written Exam

High-Frequency Technology incl. Communication Technology Lab			
ECTS Points	5	**Graded**	Yes
Workload in hours	Total: 90 + Lab Mandatory attendance: 36 Independent study: 54		
Course description	High Frequency Electronics: Physical Fundamentals of Semiconductor Devices – Bohr-Sommerfeld Postulates - Schrödinger Equation - Ribbon Diagram - Effective Mass and Mobility Transistor Devices for High Frequencies - Heterobipolar Transistor (HBT) - Bipolar Transistor High Frequency Behavior - Gallium Arsenide Field Transistor, GaAs- FET, MESFET - High Electron Mobility Transistor (HEMT) - Application Areas of the Different Semiconductor Technologies Monolithic Microwave Integrated Circuits (MMICs) - MMIC Technologies - Structure and Interconnection for Chips - Types of Monolithic Microwave Circuits Circuit Technology with transistors for High Frequency Applications - Operating Point Adjustment - High-frequency Switches with MESFET Transistors - Small-signal Transistor Amplifiers - Large Signal Transistor Amplifiers - (Ultra)-Broadband Amplifier Transistor Oscillators - Application Fields, Properties - Two-Pole Oscillator - Four-Pole Oscillator - Oscillator Circuits, Structural Systematics of LC Oscillators - HF-VCO and PLL RF-MEMS Microelectromechanical Structures		
Aims and skills	**PROFESSIONAL COMPETENCY** Upon completion of the module, students will be able to - understand and develop essential requirements for high-frequency electronic systems **METHODOLOGICAL COMPETENCY** After completing the module, students will be able to		

	- independently analyze and understand problems in high-frequency electronics **COMPREHENSIVE ACTION COMPETENCY** After completing the module, students will be able to - gain insight into numerous related fields of Electrical Engineering, Electronics, High Frequency and Communications Engineering
Prerequisites	None
Examination	Written examination

Systems Theory			
ECTS Points	5	**Graded**	Yes
Workload in hours	Total: 150 Mandatory attendance: 48 Independent study: 102		
Course description	**TEACHING AND LEARNING UNITS PRESENTATION TIME SELF-STUDY** - Basic Terms and Definitions of “Signals” and “Systems” - System Response to any input signal - Continuous-Time signals and their Functional Transformations - Fourier Series, Fourier Transformation, Basics of Spectral Analyses - Laplace Transformation - Discrete Time Signals - z-Transformation - Sampling Theorem - Functional Domain System Description - Transfer function of Linear, Time-Invariant Systems - Differential Equations and Laplace Transformation - Differential Equations and z-Transformation - Introduction to Discrete-Time, Recursive, and Non-Recursive Systems		
Aims and skills	**PROFESSIONAL COMPETENCY** After completing the module, students will be able to - select and use mathematical methods of Systems Theory for different applications of system description - distinguish the terms Time-Frequency-Image domain and decide when and in which domain it is best to conduct their Systems Theory considerations - -- understand the most important functional transformations of Systems Theory and apply them to examples in Electrical Engineering - understand the transmission behavior of systems in the image area and apply it according to the rules **METHODOLOGICAL COMPETENCY** After completing the module, students will be able to - significantly expand their abstract thinking in Systems Theory and recognize its importance for solving inconspicuous problems		

	- grasp the possibilities and limitations of mathematical system-theoretical calculations as well as of simulations and evaluate their significance - develop solution strategies to abstract, modularize, and analyze general complex systems **COMPREHENSIVE ACTION COMPETENCY** After completing the module, students will be able to - apply the methods of Systems Theory to a wide range of problems in Electrical Engineering and therefore illustrate interrelationships in a wide range of areas and design the system behavior there - work in simple system simulation and System Theory tasks with reference to specific applications in Electrical Engineering and select and apply relevant methods as well as conventional techniques - act under guidance within given focal points of Systems Theory - apply and deepen skills and knowledge in the simulation, analysis and description of systems to complex examples of Electrical Engineering
Prerequisites	The relevant functional transformations will be treated on the basis of the basic mathematics lectures. Simulation examples based on simulation software (e.g. MATLAB, SIMULINK) will illustrate the theoretical contents in practice:
Assessment	Written examination

Mechanical Engineering

Engineering Design & Development			
ECTS Points	5	**Graded**	Yes
Workload in hours	Total: 150 Mandatory attendance: 60 Independent study: 90		
Course description	Engineering Design 1 - Technical Drawing, Plane and Spatial Sketching - Dimensional, Form and Positional Tolerances and Fits. - Fundamentals of Design Theory (Stress/Manufacturing Related). Construction Design 1: - Creation, Reading and Understanding of Technical Drawings: Representation, Dimensioning, Tolerances, Edge States, Technical Surfaces, Heat Treatment		
Aims and skills	**PROFESSIONAL COMPETENCY** Upon completion of the module, students will have acquired the competence to create and interpret technical drawings for simple designs according to given tasks. They will be able to describe the effects of the design on the production process. **METHODOLOGICAL COMPETENCY**		

	Problems that arise in the professional environment in the subject area of “Technical Drawing” will be identified and solved using the methods presented. They will be able to collect and interpret relevant information using these methods. **PERSONAL AND SOCIAL COMPETENCY/PERSONAL AND SOCIAL SKILLS** Upon completion of the module, students will have acquired initial competencies to take social and ethical findings into account when making decisions in their everyday professional lives. **COMPREHENSIVE ACTION COMPETENCY** Upon completion of the module, students will have acquired a solid basic understanding of the topics “Reading & Understanding Technical Drawings” and “Creating Technical Drawings in Accordance with Standards” and will be able to create simple designs. They will be able to obtain missing information from given sources and will be able to explain their approach in a technical discussion.
Prerequisites	None
Assessment	Construction Design or Combined Exam (Written Exam < 50%)

Quality Management			
ECTS Points	3	**Graded**	Yes
Workload in hours	Total: 150 Mandatory attendance: 60 Independent study: 90		
Course description	- Role of Quality Management in the company, - Quality Management Manual (e.g. Structure and use of Process Maps, Process Descriptions, Flow Descriptions, etc.), -Become acquainted with and apply the objectives and contents of quality standards by way of example and learn how to apply them, - Become acquainted with selected methods and tools (e.g. Design Review, DRBFM, Quality Assessment, Reliability Engineering, Tolerance Management, Design of Experiments, FMEA, Quality Control Chart, Inspection and Test Equipment, Machine Process Capability, etc.) and, if necessary, apply them in an exemplary manner. - Become acquainted with techniques in the various company areas (e.g. Development, Procurement, Production) and learn to apply them using examples. - Quality: Costs and Benefits - Connection to environmental protection and product liability.		
Aims and skills	**PROFESSIONAL COMPETENCY** Basic knowledge of QM-relevant contexts, processes and methods in the industrial environment **METHODOLOGICAL COMPETENCY**		

	first own practical experience in the exemplary application of some methods **PERSONAL AND SOCIAL COMPETENCE** Assessing the impact of QM-relevant measures (e.g. Planning, Documentation, etc.) on employees as well as customers, suppliers and uninvolved third parties. **COMPREHENSIVE ACTION COMPETENCY** Recognize goals and interrelationships relevant to QM in everyday operations, be able to assign methods and apply them in an exemplary manner.
Prerequisites	
Assessment	Written examination

Finite Elements			
ECTS Points	3	**Graded**	Yes
Workload in hours	Total: 150 Mandatory attendance: 60 Independent study: 90		
Course description	- Introduction to the Finite Element Method - Basic Terms (Element Types, Bar Element, Beam Element, Plate Element, Shell Element, and Volume Element) - Element Criteria - Elasticity Theory (Stresses, Strains, Material Laws, Strain Energy, Virtual Work) - Variation Principles (e.g. Minimum of the total Potential, Virtual Work, Lagrange Equations) - Ritz Principle - Linear, Static Finite Element Equations - Solution Methods Optional Lecture Topics: - Galerkin Method - Nonlinear Finite Element Equations - Transient Finite Element Equations (explicit/implicit methods) - Natural Vibration Analysis Laboratory Exercises: - Pre- and Post- Processing - Geometry Creation, Import, Cleanup - Statistic Analyses - Surface and Volume Meshing - Connection Techniques (Screw Connection, Contact, ...): Optional Laboratory Exercises: - Natural Vibration Analysis - Topology Optimization		

Aims and skills	**PROFESSIONAL COMPETENCY** Upon completion of the module, students will be able to apply to the theories, models and discourses mentioned in the module content and detailed finite elements. They will be able to differentiate connections, and influences within problem situations and, based on this, develop new proposals for solutions and evaluate them critically. **METHODOLOGICAL COMPETENCY** Graduates will possess the spectrum of methods and techniques listed in the module contents for processing complex, scientific finite element problems from which they will select and apply appropriate methods to develop new solutions. They will have in-depth technical and application knowledge of individual methods.
Prerequisites	none
Assessment	Written exam

Informatics

Mobile Sensors and Actuators			
ECTS Points	2,5	**Graded**	Yes
Workload in hours	Total: 75 Mandatory attendance: 36 Independent study: 39		
Course description	Principles of Sensors and Actuators, A-D and D-A Conversion, Automation and Control Technology Sensors, Sensor Systems. A selection from: Typical Sensor Characteristics – Selected Sensors (e.g. Length, Temperature, Force, Pressure, Strain, Humidity, Flow) - Adaptation and Linearization Circuits for Sensors – Measured Signal Preprocessing – Measured Value Transmission – Measured and Test Signals, Standardization, Signal Transmission – Measured Chain (especially Sensitivity, Transmission Behavior) – Dealing with interference sources and noise in sensor systems – Digital Measured Value Processing – Systematic and Statistical Measurement Errors, Measuring Device Capability – Actuators of control and automation technology – Electromagnetic Actuators (Relays, Contractors, etc.) – Electrodynamic Actuators (e.g. Voice Coil Actuators). Fluidic Actuators (Pneumatic, Hydraulic) and Control Systems – Thermobimetals – Microactors – Electrochemical Actuators		
Aims and skills	**PROFESSIONAL COMPETENCY** The students will become familiar with technical terminology for sensors and actuators and their principles. The students will be able to select sensors and actuators for a given task and justify them technically. **METHODOLOGICAL COMPETENCY** Systematic application of expertise to solve problems in future technologies.		

	COMPREHENSIVE ACTION COMPETENCY Upon completion of the module, students will have acquired the competencies to independently develop solutions for technical problems and to systematically implement them. They will be able to critically reflect on and evaluate their own approach to the design of systems and processes and to exploit optimization potential.
Prerequisites	None
Assessment	Written exam or combined examination

Artificial Intelligence 1/Fundamentals

ECTS Points	2,5	**Graded**	Yes
Workload in hours	Total: 75 Mandatory attendance: 36 Independent study: 39		
Course description	Fundamentals and Definition of Knowledge and Modeling - Use of Logic and Automatic Reasoning - Use of Heuristics (e.g. Heuristic Search) - Representation of unclear problems (e.g. Probabilistic Networks, Evidence Theory/Dempster) - Shafer/Fuzzy System - Analogy and Affinity - Fundamentals of Machine Learning - Application areas of Artificial Intelligence (e.g. Design of Digital Circuits, Big Data, Autonomous Systems, Intelligent Interaction) - Practical Applications of Artificial Intelligence Methods		
Aims and skills	**PROFESSIONAL COMPETENCY** Students will become familiar with basic methods and theories in the field of Artificial Intelligence (AI), and they will be able to name and compare them. **METHODOLOGICAL COMPETENCY** Students will be able to apply the taught methods of AI to predefined/ minor problems and if necessary, implement them as an application.		
Prerequisites	None		
Assessment	Written exam		

Database Applications

ECTS Points	2,5	**Graded**	Yes
Workload in hours	Total: 75 Mandatory attendance: 36 Independent study: 34		
Course description	Lab Current Database Technologies 36 39 Current Database Technologies are to be implemented and performed with these exercises independently and under guidance (including the presentation of general concepts such as MapReduce and concrete application examples using various database systems such as Redis, CouchDB, Hadoop, Apache Kafka, etc.).		
Aims and skills	**PROFESSIONAL COMPETENCY** Students will be able to evaluate concepts of current database architectures and database technologies. Students will learn the purpose of data warehouse (DWH) concepts and will be able to evaluate complex DWH architectures. Students will gain knowledge of the structure and operation of a DWH and the principles of DWH data modeling and storage. **METHODOLOGICAL COMPETENCY** Students will be able to assess the strengths and weaknesses of current database technologies and database architectures as well as data warehouse concepts with respect to their applicability in a professional environment. **PERSONAL AND SOCIAL COMPETENCE/SKILLS** Students will be able to use their decision-making and technical skills in the area of database technologies and database architectures, as well as data warehousing to adequately assess current concepts and involve experts from other areas (especially the application area). **COMPREHENSIVE ACTION COMPETENCY** Students will have acquired the ability to apply theoretical concepts of current database architectures and database technologies, as well as data warehouse concepts, to practical applications beyond their in-depth technical knowledge.		
Prerequisites	Database		
Assessment	Written examination		

Aerospace Engineering

Flight Dynamics 1 - Aerodynamics			
ECTS Points	3,5	**Graded**	Yes
Workload in hours	Total: 90 Mandatory attendance: 36 Independent study: 54		
Course description	Aerodynamics: Physical Properties of the Atmosphere Incompressible, Frictionless Flows Compressible, Frictionless Flows Flows with Friction, Boundary Layer Theory Airfoil Theory Airfoils in Incompressible and Compressible Flows Fundamentals of Computational Fluid Dynamics		
Aims and skills	**PROFESSIONAL COMPETENCY** After completing the module, students will be able to - use mathematical methods and apply them to problems of flight physics in aerospace engineering - apply expertise in fundamental mathematics and physics to develop and implement solutions in flight physics to recognize and evaluate implications **METHODOLOGICAL COMPETENCY** After completing the module, students will be able to - describe and analyze flight physics tasks and develop various solutions for them - gather information, assumptions and justifications about products, processes from various sources and evaluate them according to other technical aspects - recognize the limits and uncertainties of their own knowledge and skills **COMPREHENSIVE ACTION COMPETENCY** After completing the module, students will be able to - effectively use technical literature, conventions/conferences, and other sources of information to update their knowledge and skills in flight physics throughout their lives - contribute interdisciplinary knowledge with consideration to economic effects - present complex interrelationships in a team, actively participate in the exchange of information and ideas, deal with criticism and take responsibility - describe technical process flows in industrial companies and classify their own activities in the context of a process chain		
Prerequisites	None		
Assessment	Written exam		

Flight Dynamics 2 – Flight Mechanics

ECTS Points	3,5	**Graded**	Yes
Workload in hours	Total: 90 Mandatory attendance: 36 Independent study: 54		
Course description	Flight Mechanics Introduction to Flight Mechanics - Flight Mechanical Coordinate Systems - Aircraft Movements - Aircraft Forces and Torques - Aircraft Control - Longitudinal Motion - Lateral Motion - Flight Properties Longitudinal Movement - Flight Mechanical Coefficients for Wings and Tail Units - Flight Mechanical Coefficients for the Entire Aircraft - Aircraft Static Longitudinal Stability - Controllability in Longitudinal Motion, Trim Lateral Movement - Flight Mechanical Coefficients for Wings and Tail Units - Flight Mechanical Coefficients for Entire Aircraft - Aircraft Static Lateral Stability - Controllability in Lateral Motion		
Aims and skills	**PROFESSIONAL COMPETENCY** After completing the module, students will be able to - use mathematical and numerical flight physics and apply them to aerospace engineering problems - apply the expertise of flight physics to develop and implement technical solutions in their specific fields of aerospace engineering work, and to identify and evaluate their effects **METHODOLOGICAL COMPETENCY** After completing the module, students will be able to - describe and analyze tasks in flight physics and independently develop various solutions and take responsibility for them. - recognize the limits and uncertainties of their own knowledge and skills **COMPREHENSIVE ACTION COMPETENCY** After completing the module, students will be able to - effectively use technical literature, conventions/conferences, and other sources of information to update their knowledge and skills in flight physics throughout their lives - present complex interrelationships in a team, actively participate in the exchange of information and ideas, deal with criticism and take responsibility - undertake and execute project tasks or projects in their field of activity in compliance with time, cost, quality and customer requirements.		
Prerequisites	None		

Assessment	Written exam

Industrial Engineering

Industry 4.0 / Smart Factory			
ECTS Points	2,5	**Graded**	Yes
Workload in hours	Total: 75 Mandatory attendance: 37 Independent study: 38		
Course description	Industry 4.0 Motivation and Smart Production Term Definitions - Development of Automation - Technological Foundations and Standards - Basic Concepts of a Smart Factory - Reference Architectures - Smart Factory Engineering - Security		
Aims and skills	**PROFESSIONAL COMPETENCY** The students will be able to analyze and process complex problems from practice in such a way that they can create corresponding statements and calculations. They will obtain the relevant information for the solution, carry out the calculation or analysis independently and provide critical information on the resilience of their results. **METHODOLOGICAL COMPETENCY** Upon completion of the module, students will be able to select and apply an appropriate method for complex practical applications. Thus, they will be able to assess the possibilities, practicability and limitations of the method used and are able to identify alternative courses of action.		
Prerequisites	None		
Assessment	Written exam or combined exam		

Digital Transformation			
ECTS Points	2,5	**Graded**	Yes

Workload in hours	Total: Mandatory attendance: Independent study:
Course description	Digitalization - Digital Twin - Big Data and Data Mining - Artificial Intelligence - Blockchain Technology - Digital Payment - Evolution, Disruption or Revolution?
Aims and skills	**PROFESSIONAL COMPETENCY** The students will be able to analyze and process complex problems from practice in such a way that they can create corresponding statements and calculations. They will obtain the relevant information for the solution, carry out the calculation or analysis independently, and provide critical information on the resilience of their results. **METHODOLOGICAL COMPENTENCE** Upon completion of the module, students will be able to select and apply an appropriate method for complex practical applications. Thus, they will be able to assess the possibilities, practicability and limitations of the method used and will be able to identify alternative courses of action.
Prerequisites	None
Assessment	Written exam or combined exam

Production and Logistics

ECTS Points	5	**Graded**	Yes
Workload in hours	Total:150 Mandatory attendance: 50 Independent study: 100		
Course description	- Foundations and Success Factors of Production and Logistics Systems - Production Organization - Master Data - Production Scheduling - Material Requirements Planning - Lot Sizing and Inventory Management - Scheduling and Capacity Planning		
Aims and skills	**PROFESSIONAL COMPETENCY** The students will learn the basics of production and logistics. They will be able to understand essential structural decisions (such as organization type, master data) and to evaluate the suitability of alternatives on the use case.		

	Students will be able to explain the process of production planning and control and analyze interrelationships and interactions. This includes production program planning, material requirements planning, lot sizing and inventory management, scheduling and capacity planning and production control. **METHODOLOGICAL COMPETENCY** Students will be able to apply the production planning and production control methods covered (e.g., production program planning, demand determination, forecasting methods, lot sizing). **PERSONAL AND SOCIAL SKILLS/COMPETENCY** Students will be able to recognize the economic and social implications of automation and outsourcing. **COMPREHENSIVE ACTION COMPETENCY** Students will develop an integral understanding of the processes, dependencies and conflicts of production and logistics.
Prerequisites	None
Examination	Written exam

Embedded Systems

Automotive Software Engineering			
ECTS Points	5	**Graded**	Yes
Workload in hours	Total: 150 Mandatory attendance: 48 Independent study: 102		
Course description	Advanced issues to the software engineering process in the automotive environment: - Influence of ISO 26262 on the Software Engineering Process - Specification and implementation of real-time systems - Usability and SW ergonomics - Security and Data Protection Aspects - Diagnostic Development and Parameterization of Software Functions in Motor Vehicles - Current Topics and Trends in Software Engineering Software Project Management - Specific Software Problems - Development Cycle - Structural and Process Organization - Effort Estimation - Planning - Risk Management - Project Implementation		
Aims and skills	**PROFESSIONAL COMPETENCY** Students will be able to analyze and work through complex problems from practice and in so doing will gain the relevant information for the solution, develop a suitable software architecture with relevant techniques and certify it according to current procedures. **METHODOLOGICAL COMPETENCY**		

	Upon completion of the module, students will be able to select and apply an appropriate method for complex practical applications. Thus, they will be able to assess the possibilities, practicability, and limits of the method used and will be able to show alternative courses of action and evaluate them technically as well as economically. **PERSONAL AND SOCIAL COMPETENCE/SKILLS** Students will become cognizant of their role and responsibility in the company. They will be able to weigh technical, theoretical, and economic issues against each other and implement them in a solution-oriented manner. **COMPREHENSIVE ACTION COMPETENCY** Students will have learnt to quickly adapt to new situations and to integrate into new tasks and teams. The students will independently think and act responsibly using critical judgmental skills. They will be characterized by sound technical knowledge, an understanding of overarching interrelationships and will be able to transfer theoretical knowledge into practice. They will solve problems in a professional environment in a methodological, goal- and team-oriented manner.
Prerequisites	
Assessment	Programming design

Aerospace Software Engineering

ECTS Points	5	**Graded**	Yes
Workload in hours	Total: 150 Mandatory attendance: 48 Independent study: 102		
Course description	- Unified Process with Phase and Process Components - Applications - Design Patterns - Refactoring and Refactorings - Design Heuristics and Rules - Methods of Software Quality Assurance - Requirements Engineering - Usability/SW Ergonomics - SW Management (e.g. ITIL) - Deepening of Safety Considerations in Aerospace SW Development (ARP4754A; RTCA-DO/178C) - Different Criticality Levels (Avionics: A to D) -Impact on Design/Requirements - Impact on Test/Code Coverage /Analyses – Software Erosion		
Aims and skills	**PROFESSIONAL COMPETENCY** Students will be able to analyze and work through complex problems from practice and in doing so will gain the relevant information for the solution, will develop suitable software architecture with relevant techniques and will certify it according to current procedures and standards in accordance with aerospace guidelines. **METHODOLOGICAL COMPETENCY**		

	Upon completion of the module, students will be able to select and apply an appropriate method for complex practical applications. Thus, they will be able to assess the possibilities, practicality, and limits of the method used and will be able to show alternative courses of action and evaluate them technically as well as economically. **PERSONAL AND SOCIAL COMPETENCE/SKILLS** Students will become cognizant of their role and responsibility in the company. They will be able to weigh technical, theoretical, and economic issues against each other and implement them in a solution-oriented manner **COMPREHENSIVE ACTION COMPETENCY** Students will have learnt to quickly adapt to new situations and to integrate into new tasks and teams. The students will independently think and act responsibly using critical judgmental skills. They will be characterized by sound technical knowledge, an understanding of overarching interrelationships and will be able to transfer theoretical knowledge into practice. They will solve problems in a professional aerospace environment in a methodological, goal- and team- oriented manner.
Prerequisites	
Assessment	Programming design