Anrechnung Virginia Tech Aeronautical Engineering Kurse an der HAW Hamburg (BSc Flugzeugbau)

Virginia Tech Course	HAW Hamburg course
2104: INTRODUCTION TO AEROSPACE ENGINEERING Introduction to aerospace engineering with foundational material in aerodynamics, propulsion, structures, flight performance, astromechanics, and design. History of aeronautics and astronautics, aircraft and spacecraft types, aircraft and spacecraft components and the atmosphere. Concepts of lift, drag, and steady level flight. Concepts of viscosity and compressibility. Introduction to motion of vehicles and bodies in space.	Flugzeugprojekt (FPR); Ausgleich von 1ETCS erforderlich
3014: AERO/HYDRODYNAMICS Two-dimensional potential flow, stream function, velocity potential, flow superposition, circulation and lift, airfoil characteristics. Two-dimensional airfoil theory and panel methods. Three-dimensional lifting line theory and vortex lattice solutions for finite wings.	Aerodynamik mit Labor 1 (AML1). In Verbindung mit 4154: AML1 und AML2, dann Ausgleich von 2ECTS erforderlich.
3034: VEHICLE VIBRATION AND CONTROL Free and forced motions of first order system. Free and forced motions of second order systems both undamped and damped. Frequency and time response. Introduction to control, transfer functions, block diagrams, and closed loop system characteristics. Higher order systems.	Freies Wahlpflichtfach: Aktive Schwingungsdämpfung
3044: BOUNDARY LAYER AND HEAT TRANSFER Concepts of viscous flows and physical properties equations of laminar motion with heat and mass transfer; exact and approximate solutions; finite-difference methods; transition to turbulence; analysis in turbulent flows. Conduction and convective heat transfer.	Freies Wahlpflichtfach: Grenzschichttheorie und Wärmeübertragung
3054: AOE EXPERIMENTAL METHODS Principles of measurement and measurement systems; standards, accuracy, uncertainty and statistical concepts. Practical electronics, detectors, transducers and instruments for aerospace and ocean engineering. Signal conditioning systems and readout devices; digital data acquisition, structures, structural dynamics, fluid dynamics, materials and wind-tunnel testing.	Grundlagen der Messtechnik (MTL)
3094: MATERIALS & MANUFACTURING FOR AERO & OCEAN ENGINEERS This course introduces the student of Aerospace and/or Ocean Engineering to the fundamental properties of materials typically required for structural design. The performance characteristics of metals, ceramics, polymers, and composites are presented and contrasted. Foundation principles underlying materials manufacturing are also presented with the goal of providing an understanding of how processing affects material properties and performance.	Freies Wahlpflichtfach: Werkstoffe und ihre Verarbeitung für Flugzeugingenieure
3114: COMPRESSIBLE AERODYNAMICS Inviscid, compressible gas dynamics. Continuity, momentum and energy equations, shock waves, Prandtl-Meyer expansions. One-dimensional steady and unsteady flow, Rayleigh line, Fanno line, Shock Tubes. Method of Characteristics, supersonic thin airfoil theory and conical flow.	Freies Wahlpflichtfach: Höhere Aerodynamik
3124: AEROSPACE STRUCTURES Aspects of structural analysis pertinent to the design of flight vehicles: aero-elastic divergence, environmental loads, aerospace materials, buckling of thin-walled compression members, and introduction to matrix structural dynamics.	Strukturkonstruktion 1 (SKO1)
3134: STABILITY AND CONTROL Equations of vehicle motion. Linearized analysis. Estimation of stability derivatives, longitudinal and lateral-directional static stability, and control requirements. Dynamic characteristics including stability and mode shapes.	Freies Wahlpflichtfach: Stabilitätstheorie und Regelungstechnik im Flugzeugbau
4004: COMPUTER-AIDED CONTROL SYSTEM DESIGN Computer-aided design and analysis of control systems for high-order linear systems. Stability and performance design criteria. Root locus, PID, lead/lag, and pole-placement design methods. Introduction to modern state-space modeling methods. Design problems involving aircraft, ship, space, and ground-vehicle systems.	Freies Wahlpflichtfach: Stabilitätstheorie und Regelungstechnik im Flugzeugbau

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Virginia Tech Course	HAW Hamburg course
4024: AN INTRODUCTION TO THE FINITE ELEMENT METHOD The finite element method is introduced as a numerical method of solving the ordinary and partial differential equations arising in fluid flow, heat transfer, and solid and structural mechanics. The classes of problems considered include those described by the second-order and fourth-order ordinary differential equations and second-order partial differential equations. Both theory and applications of the method to problems in various fields of engineering and applied sciences will be studied.	Finite Elemente (FEM)
4054: STABILITY OF STRUCTURES Introduction to the methods of static structural stability analysis and their applications. Buckling of columns and frames. Energy method and approximate solutions. Elastic and inelastic behavior. Torsional and lateral buckling. Use of stability as a structural design criterion.	Freies Wahlpflichtfach: Stabilität von mechanischen Strukturen
4064: FLUID FLOWS IN NATURE Course designed to build upon and broaden a basic traditional engineering knowledge of fluid flows into areas concerning a variety of natural occurrences and phenomena that involve fluid motions in important ways. Drag of sessil systems and motile animals, gliding and soaring, flying and swimming, internal flows in organisms, low Reynolds number flows, fluid-fluid interfaces, unsteady flows in nature and wind engineering.	Freies Wahlpflichtfach: Strömungslehre an Beispielen in der Natur
4154: AEROSPACE ENGINEERING LABORATORY Wind tunnel laboratory experiments related to subsonic and supersonic aerodynamics. Continuation of AOE 3054 for Aerospace Engineering students. Writing of technical laboratory reports; design of experiments.	Ergänzungsfach für 3014, siehe oben Allein nicht anerkennbar.
4234: AEROSPACE PROPULSION SYSTEMS Design principles and performance analysis of atmospheric and space propulsion engines and systems. Application of thermodynamics, compressible fluid flow and combustion fundamentals to the design of gas turbine and rocket engines and components, including inlets, turbomachines, combustors, and nozzles. Matching of propulsion system to vehicle requirements.	Wahlpflichtfach: Flugzeugtriebwerke (FTW)

- Diese Tabelle wurde vom Prüfungssaussschuss des Departments Fahrzeugtechnik und Flugzeugbau erarbeitet. Sie dient den Studierenden, um ihre Fächer an der VirginiaTech zu planen und diese Planung dem Prüfungsausschuss vor dem Austausch vorzustellen.
- Die Genehmigung der Fachkombinationen sowie ein evtl. zwischen Fächern erforderlicher Ausgleich der CreditPoints wird vom Prüfungsausschuss für Austauschstudierende einzeln schriftlich genehmigt.
- Es sind zwei *freie* Wahlpflichtfächer möglich. Für die beiden übrigen Wahlpflichtfächer besteht eine Bindung zum Fächerkatalog der Bachelor-Prüfungsordnung. Das Fach Flugzeugtriebwerke (FTW) entstammt dem Fächerkatalog.
- Die Tabelle bezieht sich auf Studierende nach der Prüfungsordnung 2015. Eine Anerkennung von Fächern der Virginia Tech ist auch für Studierende nach der Prüfungsordnung 2010 auf Anfrage beim Prüfungsausschuss möglich. Hier können kleinere Unterschiede zu den oben dargestellten Anerkennungsgmöglichkeiten auftreten.

2017-10-05

Prof. Dr.-Ing. Sven Füser
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Department Fahrzeugtechnik und Flugzeugbau
HAW Hamburg