

## Systems and Automation (SYAT)

|   | Study Profiles:                     |   |   |                                     |
|---|-------------------------------------|---|---|-------------------------------------|
|   | I. Automatisierung in der Industrie | II. Automatisierung in der Energietechnik | III. Automatisierung in der Kommunikation | IV. Automatisierung in Smart Living |
| <b>A) Catalogue CORE</b>  |                                     |   |   |                                     |
| 1. Estimation and Detection Theory  | X                                   | X   | X   | X                                   |
| 2. Identification and Control of Mechatronic Systems                      | X                                   | X   | X   | X                                   |
| 3. Modeling of Mechatronic Systems  | X                                   | X   | X   | X                                   |
| 4. Modern Control Systems   | X                                   | X   | X   | X                                   |
| 5. Optimization in Engineering  | X                                   | X   | X   | X                                   |
| 6. Robotics and Man-Machine-Interaction 1                                 | X                                   |   |   | X                                   |
| <b>B) Catalogue ELECTIVE</b>  |                                     |   |   |                                     |
| 1. Remaining modules of catalogue CORE                                    | X                                   | X   | X   | X                                   |
| 2. Acoustic Virtual Reality   |                                     |   | X   | X                                   |
| 3. Ad-Hoc Networks: Architectures and Protocols                           | X                                   | X   | X   | X                                   |
| 4. Advanced Control Systems   | X                                   | X   | X   | X                                   |
| 5. Advanced Electrical Drives   | X                                   | X   |   |                                     |
| 6. Advanced Topics in Signal Processing and Communication                 | X                                   |   | X   |                                     |
| 7. Aufbau und Netzbetrieb von Windenergieanlagen                          | X                                   | X   |   |                                     |
| 8. Automation of Complex Power Systems                                    | X                                   | X   |   |                                     |
| 9. Battery Storage Systems  |                                     | X   |   |                                     |
| 10. Chemical Sensors and Actuators in Silicon Technology                  | X                                   |   |   | X                                   |
| 11. Communication Protocols   |                                     | X   | X   | X                                   |
| 12. Digital Image Processing 1  | X                                   |   |   | X                                   |
| 13. Digital Image Processing 2  | X                                   |   |   | X                                   |
| 14. DSP Design Methodologies and Tools                                    |                                     |   | X   | X                                   |
| 15. Dynamic of Electrical Machines  | X                                   | X   |   |                                     |
| 16. Dynamik der Mehrkörpersysteme   | X                                   | X   |   |                                     |
| 17. Eingebettete Systeme  | X                                   | X   | X   | X                                   |
| 18. Electroacoustics  | X                                   |   | X   | X                                   |
| 19. Electronic and Optical Measurement Techniques                         | X                                   |   |   |                                     |
| 20. Electric Rail, Linear Drives and Magnetic Levitation                  | X                                   | X   |   |                                     |
| 21. Fundamentals of Big Data Analytics                                    | X                                   | X   | X   | X                                   |
| 22. HF-System und Überwachungstechnik 2                                   |                                     |   | X   |                                     |
| 23. High Frequency Technology – Antennas and Wave Propagation             |                                     |   | X   |                                     |
| 24. High Frequency Technology – Passive RF Components                     |                                     |   | X   |                                     |
| 25. Internet of Things and Sensor Networks                                |                                     |   | X   | X                                   |
| 26. Künstliche Neuronale Netze  | X                                   | X   | X   | X                                   |
| 27. Machine Learning for Speech and Audio Processing                      | X                                   |   | X   | X                                   |
| 28. Measurement Techniques and Distributed Intelligence for Power Systems |                                     | X   |   |                                     |
| 29. Medical Acoustics: Technologies for Hearing Systems and Ultrasound    |                                     |   | X   | X                                   |
| 30. Medical Acoustics: Audiology and Voice                                |                                     |   | X   | X                                   |
| 31. Medical Systems - Medical Instrumentation and Signal Processing       |                                     |   |   | X                                   |

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|--|---|---|---|---|
| 32. Medical Systems – Quantitative Physiology and Life Supporting Systems  | X |   |   | X |
| 33. Mikrocontrollerprogrammierung und Fehlersuche                          | X | X | X | X |
| 34. Mobile Radio Systems 1   | X | X | X | X |
| 35. Modeling and Simulation of Complex Power Systems                       |   | X |   |   |
| 36. Multimedia Content Analysis  |   |   |   | X |
| 37. Navigation for Safety-Critical Applications                            | X |   | X |   |
| 38. Optical Telecommunications 1: Devices                                  |   |   | X |   |
| 39. Optical Telecommunications 2: Systems                                  |   |   | X |   |
| 40. Physical Sensors in Silicon Technology                                 | X |   |   | X |
| 41. Power Electronics - Control, Synthesis and Applications                | X | X |   |   |
| 42. Power Management Integrated Circuits                                   | X |   | X | X |
| 43. Power System Dynamics  |   | X |   |   |
| 44. Principles and Design of Information Transmission Systems and Networks | X | X | X | X |
| 45. Prozessleittechnik und Anlagenautomatisierung                          | X | X |   |   |
| 46. Psychoacoustics and Methods for Listening Experiments                  |   |   | X | X |
| 47. Radar System Design and Applications                                   | X |   | X |   |
| 48. Radar Systems  | X |   |   | X |
| 49. Rapid Control Prototyping  | X |   |   |   |
| 50. RF-Systems   |   |   | X | X |
| 51. Robotics and Men-Machine-Interaction 2                                 | X |   |   | X |
| 52. Satellite Navigation   | X |   | X | X |

### **C) Catalogue LABORATORY**

|  |   |   |   |   |
|--|---|---|---|---|
| 1. Advanced Network Programming – Switching and Routing                  | X | X | X | X |
| 2. Analog and Mixed Signal Electronics                                   | X | X | X | X |
| 3. Automation of a distillation plant                                    | X | X | X | X |
| 4. Battery Storage Systems   | X | X | X | X |
| 5. FPGA Design Technology  | X | X | X | X |
| 6. High Frequency Technology Laboratory                                  | X | X | X | X |
| 7. MATLAB Advanced – Digital Signal Processing                           | X | X | X | X |
| 8. Optimization Lab for Communication and Signal Processing Using MATLAB | X | X | X | X |
| 9. Machine Learning  | X | X | X | X |
| 10. Radar Laboratory   | X | X | X | X |
| 11. Satellite Navigation   | X | X | X | X |

### **D) Catalogue PROJECT**

|  |   |   |   |   |
|--|---|---|---|---|
| 1. Electromagnetic Noise in Power Electronics                          | X | X | X | X |
| 2. Mechatronics  | X | X | X | X |
| 3. Medizintechnik und verwandte Gebiete                                | X | X | X | X |
| 4. System software for the real-time simulation of technical processes | X | X | X | X |