

## Annex A. Courses by Partners

This annex comprises all courses grouped by partner provided in the METIS catalogue.

The following partners participated in course creation:

- Semi Europe (P1)
- Infineon (P2)
- Arcelik (P7)
- TU Graz (P9)
- Imec (P10)
- Dresden Chip Academy (P11)
- USN (P12)
- BME (P14)
- IAL-FVG (P15)
- WITEC (P18)

Detailed descriptions for every course can be found in Appendix B. Syllabi, where we list the syllabi of all courses.

### A.1 Semi Europe (P1)

Semi Europe (P1) provides the following courses:

ID	Course Name	LH	EQF
<a href="#">P1.1</a>	Creative Computing—Introduction to Scratch Programming	2	4
<a href="#">P1.2</a>	Logic Gates and Binary Calculations	2	4
<a href="#">P1.3</a>	Intro to Semiconductors	2	4
<a href="#">P1.4</a>	Education and Career Paths	2	4
<a href="#">P1.5</a>	Engineering Design Process	2	4
<a href="#">P1.6</a>	Microchips and Solar Chips	2	4

## A.2 Infineon (P2)

Infineon (P2) provides the following courses.

ID	Course Name	LH	EQF
<a href="#">P2.1</a>	Introduction to Test Engineering for IC Development	3	6
<a href="#">P2.2</a>	Introduction to Plasmaetching	2	5-7
<a href="#">P2.3</a>	Semiconductor Carrier Technology	8	6-7
<a href="#">P2.4</a>	OptiGEN - Scheduling and Optimisation	1	5-7
<a href="#">P2.5.1</a>	Integrated Circuits design flow and transfer of digital / analog macros into system on chip (SoC) - Part 1	3	6-7
<a href="#">P2.5.2</a>	Integrated Circuits design flow and transfer of digital / analog macros into system on chip (SoC) - Part 2	3	6-7
<a href="#">P2.5.3</a>	Integrated Circuits design flow and transfer of digital / analog macros into system on chip (SoC) - Part 3	3	6-7
<a href="#">P2.5.4</a>	Integrated Circuits design flow and transfer of digital / analog macros into system on chip (SoC) - Part 4	3	6-7
<a href="#">P2.6</a>	Process Control Monitoring - measurement in wafer manufacturing	1	6
<a href="#">P2.7</a>	Introduction to power MOSFETs	1	6-7
<a href="#">P2.8.1</a>	Introduction to Lithography - Part 1	6	6-7
<a href="#">P2.8.2</a>	Introduction to Lithography - Resists in photolithography - Part 2	6	6-7
<a href="#">P2.8.3</a>	Introduction to Lithography - Exposure - Part 3	6	6-7
<a href="#">P2.8.4</a>	Introduction to Lithography - Tools and components - Part 4	6	6-7
<a href="#">P2.8.5</a>	Introduction to Lithography - Imaging - Part 5	6	6-7
<a href="#">P2.8.6</a>	Introduction to Lithography - Processing Wafers - Part 6	6	6-7
<a href="#">P2.9.1</a>	Probabilistic System Architecture - Definition and Verification - Part 1 of 4	4	6-7
<a href="#">P2.9.2</a>	Probabilistic System Architecture - Definition and Verification - Part 2 of 4	4	6-7
<a href="#">P2.9.3</a>	Probabilistic System Architecture - Definition and Verification - Part 3 of 4	4	6-7
<a href="#">P2.9.4</a>	Probabilistic System Architecture - Definition and Verification - Part 4 of 4	4	6-7
<a href="#">P2.10</a>	Magnetic Speed Sensors	2	6-7
<a href="#">P2.11</a>	Power Semiconductors Overview	1	5
<a href="#">P2.13</a>	Basics of GaN power devices: material, design and reliability challenges	2	6-7
<a href="#">P2.14</a>	A/D and D/A Converters Fundamental Considerations and Definitions	2	5-6
<a href="#">P2.15.1-2</a>	Selected Topics on Chip Assembly for Chip Designers – Parts 1 and 2 of 8	2	6
<a href="#">P2.15.3</a>	Selected Topics on Chip Assembly for Chip Designers – Part 3 of 8	1	6
<a href="#">P2.15.4</a>	Selected Topics on Chip Assembly for Chip Designers – Part 4 of 8	1	6

<a href="#">P2.15.5</a>	Selected Topics on Chip Assembly for Chip Designers – Part 5 of 8	1	6
<a href="#">P2.15.6</a>	Selected Topics on Chip Assembly for Chip Designers – Part 6 of 8	1	6
<a href="#">P2.15.7</a>	Selected Topics on Chip Assembly for Chip Designers – Part 7 of 8	1	6
<a href="#">P2.15.8</a>	Selected Topics on Chip Assembly for Chip Designers – Part 8 of 8	1	6
<a href="#">P2.16</a>	Ion Implantation for Semiconductor Industry	4	6

### A.3 Arcelik (P7)

Arcelik (P7) provides the following courses.

ID	Course Name	LH	EQF
<a href="#">P7.1</a>	Sensors (Basic sensor concepts)	1	6-7
<a href="#">P7.2</a>	Optical sensors	1	6-7
<a href="#">P7.3</a>	Mechanical sensors	1	6-7
<a href="#">P7.4</a>	Temperature sensors	2	6-7
<a href="#">P7.5</a>	Magnetic sensors	1	6-7
<a href="#">P7.6</a>	Gas sensors	1	6-7
<a href="#">P7.7</a>	Sensor System Design	1.5	6-7
<a href="#">P7.8</a>	Sensor Data Analytics	1.5	6-7
<a href="#">P7.9</a>	Agile Project Management	1.5	6-7
<a href="#">P7.10</a>	Design Thinking	1.5	6-7
<a href="#">P7.11</a>	Biosensors	4	6-7

## A.4 TU Graz (P9)

TU Graz (P9) provides the following courses.

ID	Course Name	LH	EQF
<a href="#">P9.1</a>	ElectrONiX MOOC - Amplifiers	28	5-6
<a href="#">P9.2</a>	ElectrONiX MOOC - Digital	25	5-6
<a href="#">P9.3</a>	ElectrONiX MOOC - Resonance	20	5-6
<a href="#">P9.4</a>	ElectrONiX MOOC - Power	18	5-6
<a href="#">P9.5</a>	Reliable ICs in Design and Application	25	7
<a href="#">P9.6</a>	Basics of Microelectronics	40	6-7
<a href="#">P9.7</a>	Electromagnetic Compatibility Essentials	25	7
<a href="#">P9.8</a>	Electromagnetic Compatibility of Integrated Circuits	75	7

## A.5 Imec (P10)

Imec (P10) provides the following courses.

ID	Course Name	LH	EQF
<a href="#">P10.1</a>	Introduction to nanoscale CMOS Technology: Process flow and process modules	17	7
<a href="#">P10.2</a>	Hardware-efficient machine learning: Designing across the algorithm-architecture circuit stack	12	7
<a href="#">P10.3</a>	VHDL language and design flow	30	7
<a href="#">P10.4</a>	Advanced cleaning and surface preparation in advanced CMOS technologies	19	7
<a href="#">P10.7</a>	Photonics Integrated Circuit training	18	7
<a href="#">P10.8</a>	GaN-IC platform for power electronics Training	16	7

Bonus courses are offered by Imec. These courses have not been validated in Work Package 4.

ID	Course Name	LH	EQF
<a href="#">P10.5</a>	Frontier and trends of IC Industry Technology	23.5	7
<a href="#">P10.9</a>	Introduction to chip technology (Brightlab)	2	4

## A.6 Dresden Chip Academy (P11)

Dresden Chip Academy (P11) provides the following courses.

ID	Course Name	LH	EQF
<a href="#">P11.1</a>	Clean Room Technology/Clean Room Behaviour	24	4-6
<a href="#">P11.2</a>	Electronics Basics in the Field of Semiconductor Manufacturing	24	4
<a href="#">P11.3</a>	Integrated Circuits	24	5-6
<a href="#">P11.4</a>	Manufacturing and Assembly Processes	24	4-5
<a href="#">P11.5</a>	PLC - Advanced	24	4-6
<a href="#">P11.6</a>	PLC - Visualisation with WinCC flex	24	4-6
<a href="#">P11.7</a>	Programmable Logic Controller (PLC) - Basics	24	4-6
<a href="#">P11.8</a>	PLC - Controlling and Networking	24	4-6
<a href="#">P11.9</a>	Preventive Maintenance	24	4-6
<a href="#">P11.10</a>	PCB Production	24	4-5
<a href="#">P11.11</a>	Quality Management	24	4-6
<a href="#">P11.12</a>	Semiconductor Sensors	24	5-6
<a href="#">P11.13</a>	Signal Processing	24	4
<a href="#">P11.14</a>	Vacuum Technology	24	4-6

## A.7 USN (P12)

USN (P12) provides the following courses.

ID	Course Name	LH	EQF
<a href="#">P12.1</a>	Mechanics of Si beam and diaphragm structures	80	7
<a href="#">P12.2</a>	Viscous damping in microstructures	40	7
<a href="#">P12.3</a>	Non-viscous damping in microstructures	40	7
<a href="#">P12.4</a>	Resistive sensor front-end	40	7
<a href="#">P12.5</a>	Capacitive sensor front-end	40	7
<a href="#">P12.7</a>	Piezoresistive Si sensors	80	7
<a href="#">P12.9</a>	Piezoelectric microsensors	40	6
<a href="#">P12.10</a>	Capacitive microsensors	40	6
<a href="#">P12.11</a>	Thermal and radiation sensors	60	6



## A.8 BME (P14)

BME (P14) provides the following courses.

ID	Course Name	LH	EQF
<a href="#">P14.1</a>	Materials in Microelectronics	56	6-7
<a href="#">P14.2</a>	Nanomaterials in Microelectronics	40	6-7
<a href="#">P14.3</a>	Nanotechnology in Microelectronics	20	6-7
<a href="#">P14.4</a>	Printed Circuit Design	60	6-7
<a href="#">P14.5</a>	Quality assurance techniques in microelectronics	20	6-7
<a href="#">P14.6</a>	Smart manufacturing in microelectronics	60	6-7
<a href="#">P14.7</a>	System Design for Electronic Modules	60	6-7

## A.9 IAL-FVG (P15)

IAL-FVG (P15) provides the following courses.

ID	Course Name	LH	EQF
<a href="#">P15.1</a>	Basic Project management	64	4
<a href="#">P15.2</a>	Advanced Project management	64	5
<a href="#">P15.3</a>	Design of microcontroller devices to project specification	87	4
<a href="#">P15.4</a>	Embedded development	44	4
<a href="#">P15.5</a>	Firmware development	98	4
<a href="#">P15.6</a>	OPC - Open Platforms Communication	42	5
<a href="#">P15.7</a>	Sensor assessment applicable to the project	58	4
<a href="#">P15.8</a>	Basic IIoT Systems	66	4
<a href="#">P15.9</a>	Advanced IIoT systems	164	4
<a href="#">P15.10</a>	IIoT Solutions	182	4
<a href="#">P15.11</a>	Cloud for IoT	28	5
<a href="#">P15.12</a>	Protocols for IoT	44	4

## A.10 WiTEC (P18)

A bonus course has been offered by WiTEC (P18) – this course has not been validated in WP 4.

ID	Course Name	LH	EQF
<a href="#">P18.1</a>	Intersectionality	1	4

## A.11 External Providers

The METIS catalogue exploits synergies with external course providers to usefully supplement the catalogue. The following courses were provided by external institutions and, therefore, were not validated in Work Package 4.

ID	Course Name	LH	EQF
<a href="#">EP.1</a>	iMooX.at: Learning to code: Programming with Pocket Code	15	4
<a href="#">EP.2</a>	iMooX.at: Informatik-Fit	18	4
<a href="#">EP.3</a>	iMooX.at: The Collaboration Roadmap	7	6
<a href="#">EP.4</a>	iMooX.at: Collaboration and Co-Creation for Engineers	21	6
<a href="#">EP.5</a>	iMooX.at: Entrepreneurship and Technology: From Idea to Market	10	6
<a href="#">EP.6</a>	Cadence: VLSI Fundamentals Education Kit	100	6
<a href="#">EP.7</a>	Cadence: Analog Simulation and Layout Education Kit	100	6
<a href="#">EP.8</a>	Cadence: Verification Methodologies Education Kit	100	7
<a href="#">EP.9</a>	Cadence: Shift-Left Development Education Kit	100	7
<a href="#">EP.10</a>	Cadence: Tensilica Processor IP Education Kit	100	7
<a href="#">EP.11</a>	Synopsys: Synopsys Purple Certification - Physical Design Track	264	6-7