

List of Courses for Partner University	
National Yang Ming Chiao Tung University (NYCU)	
NYCU-01	Terahertz Systems
NYCU-02	Digital Signal Processing for Communication Systems
NYCU-03	Reliability and Failure Physics of Semiconductor Devices
NYCU-04	Semiconductor Physics and Devices (I)
NYCU-05	Digital Integrated Circuits
NYCU-06	Semiconductor Material and Device Characterization
NYCU-07	Introduction to Solid State Physics
NYCU-08	Quantum Fluids and Cryogenics
NYCU-09	Analog Circuit Design II
NYCU-10	Advanced Compound Semiconductors and Their Applications
NYCU-11	Semiconductor Optoelectronics
NYCU-12	Semiconductor Processings
NYCU-13	2D nanoelectronics: Materials, Physics, and Applications
NYCU-14	Electrochemical Energy Storage Materials
NYCU-15	Introduction to Monte Carlo Method: Simulation and Application
NYCU-16	From Fundamentals of Semiconductor Devices to Nanometer-Scale CMOS Transistors
NYCU-17	Special Topics of Semiconductor Devices: Fabrication, Characterization, and Applications
NYCU-18	Selected Topics in Advanced Nano Electronics
NYCU-19	Semiconductor Engineering
NYCU-20	Mechanical Behaviours of Materials
NYCU-21	Simulation of Electronic Devices and Basics of Quantum ATK
NYCU-22	Engineering Design
NYCU-23	Electronic Devices and Low-frequency Noise
NYCU-24	Introduction to Waveguides and Component Design
NYCU-25	VLSI Digital Signal Processing
NYCU-26	Semiconductor Physics and Devices (I)
NYCU-27	Memory Circuits and System
NYCU-28	More Than Moore Devices
NYCU-29	Analog Circuit Design
NYCU-30	Electron transport in low-dimensional systems and memories concepts
NYCU-31	Introduction to Photovoltaics
NYCU-32	Principles and Applications of Materials Characterization Techniques
NYCU-33	Introduction to Radiation Effects in Electronics
NYCU-34	Introduction to two-dimensional materials and systems
NYCU-35	Frontier Research in Quantum Fluids - Helium Physics
NYCU-36	Electrical Ceramics and Packaging Technology
NYCU-37	Intro. to Compound Semiconductor Device & Process

NYCU-38	Introduction to Amplifier Design for Radio-Frequency Communication Applications
NYCU-39	Selected Topics in Low-Dimensional Electronic Devices
NYCU-40	Power semiconductor devices: Device design, Characteristics, and Reliability
NYCU-41	Advanced Electronic Materials Science & Engineering
NYCU-42	Radiation Effects in Electronics
NYCU-43	Advanced Compound Semiconductors and Their Applications
NYCU-44	Technology Management and Practice of System Engineering (SE)
NYCU-45	Semiconductor and Energy
NYCU-46	SEMINAR
NYCU-47	ACADEMIC DISSERTATION RESEARCH

National Tsing Hua University (NTHU)	
SEMICONDUCTOR PHYSICS	
NTHU-01	The Introduction to Semiconductor Devices
NTHU-02	VLSI Devices Pyhsics
NTHU-03	Nano-Scale MOSFET Device Pyhsics
NTHU-04	Three Dimensional MOSFET and Device Physics
NTHU-05	Quantum Computation and Qubit Devices
NTHU-06	MEMS System Design
NTHU-07	Nanosystem Sensor and Actuation
NTHU-08	Electronic Nano Biomedical Sensor
NTHU-09	Semicon. Memory, Manufac. & App
NTHU-10	Semiconductor Memories
NTHU-11	Logic Non-volatile Memories
NTHU-12	3D and Next Generation Memories
NTHU-13	Artificial Neuromorphic Synapse and Memory Computing Device
NTHU-14	CMOS Image Sensor
NTHU-15	Semiconductor Light Detector and Circuit
NTHU-16	Compound Power Semiconductor Devices
NTHU-17	Semicondcutor Power Devices
NTHU-18	Semiconductor Device Design
NTHU-19	Semiconductor Device Measurement
NTHU-20	Semicondcutor Device Design and Simulation
SEMICONDUCTOR DESIGN	
NTHU-21	VLSI System Design
NTHU-22	Timing Circuit Designs & Applications
NTHU-23	VLSI Design
NTHU-24	Computer Arithmetic
NTHU-25	Memory Systems

NTHU-26	Advanced Computer Architecture
NTHU-27	Implementation of Many-Core Systems
NTHU-28	Design tools
NTHU-29	Design automation
NTHU-30	VLSI Design for Manufacturability
NTHU-31	Advanced Digital Design and Verification
NTHU-32	FPGA Architecture & CAD
NTHU-33	Introduction to quantum computing
NTHU-34	VLSI Physical Design Automation
NTHU-35	VLSI Design Automation
NTHU-36	VLSI Testing
NTHU-37	Embedded Memory Circuit Design
NTHU-38	Analog Circuit Design
NTHU-39	VLSI Design
NTHU-40	RF IC Design
NTHU-41	Wireline Communication IC
NTHU-42	Biomimetic VLSI Design
NTHU-43	Analysis & Design of Microwave Circuits
NTHU-44	AI and Signal Processing
NTHU-45	Machine Learning
SEMICONDUCTOR MATERIAL	
NTHU-46	Kinetic Process of Materials
NTHU-47	Thermodynamics of Solid State
NTHU-48	Electrochemical Analytical Techniques and Applications
NTHU-49	Inspection and Analysis for Materials
NTHU-50	Instrumental Analysis and Lab.(II)
NTHU-51	Transmission Electron Microscopy
NTHU-52	Advanced Polymer Chemistry
NTHU-53	Molecular Engineering (I)
NTHU-54	IC metals and conductors for IC
NTHU-55	2D materials
NTHU-56	Materials computation and simulations
NTHU-57	Molecular Dynamics Simulations
NTHU-58	materials for spintronics
SEMICONDUCTOR PROCESS	
NTHU-59	RET、Immersion、EUV Semiconductor Lithography
NTHU-60	Optical Proximity Correction
NTHU-61	Lithography Process and Control
NTHU-62	Scanner, track, & Metrology Equipment
NTHU-63	Lithography Mask
NTHU-64	Plasma Engineering & Applications
NTHU-65	Microwave Engineering

NTHU-66	Thin Film Physics and Technologies
NTHU-67	Plasma Physics
NTHU-68	Insp & Anals for Materials
NTHU-69	Analytical techniques for Materials Chemistry
NTHU-70	Synchrotron app in structural anal
NTHU-71	Nano-scale Optical Metrology & App
NTHU-72	Fundamental Mechanics of Electronic Packaging
NTHU-73	Optimum Structural Design
NTHU-74	Electronic Packaging technology & materials
NTHU-75	Reactive Ion Etching
NTHU-76	Ion Implantation
NTHU-77	Electron-Beam Inspection
NTHU-78	Chemical Vapor Deposition
NTHU-79	Atomic Layer Deposition

National Taiwan Normal University (NTNU)	
NTNU-01	Quantum Mechanics (I)
NTNU-02	Quantum Mechanics (II)
NTNU-03	Classical Electrodynamics (I)
NTNU-04	Seminar
NTNU-05	Introduction to Semiconductor Physics (I)
NTNU-06	Introduction to Semiconductor Physics (II)
NTNU-07	Modern Advanced Materials and Optoelectronics (I)
NTNU-08	Modern Advanced Materials and Optoelectronics (II)
NTNU-09	Solar Cells Principles and Practices
NTNU-10	Topics on Two Dimensional Quantum Materials (I)
NTNU-11	Topics on Two Dimensional Quantum Materials (II)
NTNU-12	Introduction to Novel Nano-Materials
NTNU-13	Introduction to Energy Materials

List of Courses for the Indian Institute of Technology Roorkee

Program Elective Course Basket : List of PECs (Physics)

Teaching Scheme					Contact Hours/Week			Exam Duration		Relative Weight (%)				
S. No.	Subject Code	Course Title	Subject Area	Credits	L	T	P	Theory	Practical	CWS	PRS	MTE	ETE	PRE
1.	PHN-601	Advanced Condensed Matter Physics	PEC	4	3	0	3	3	0	20	20	20	40	0
2.	PHN-603	Advanced Atmospheric Physics	PEC	4	3	0	3	3	0	20	20	20	40	0
3.	PHN-605	Advanced Laser Physics	PEC	4	3	0	3	3	0	20	20	20	40	0
4.	PHN-607	Advanced Nuclear Physics	PEC	4	3	0	3	3	0	20	20	20	40	0
5.	PHN-602	Nuclear Astrophysics	PEC	4	3	1	0	3	0	25	-	25	50	-
6.	PHN-604	Physics of Nanosystems	PEC	4	3	1	0	3	0	25	-	25	50	-
7.	PHN-606	Superfluidity and Superconductivity	PEC	4	3	1	0	3	0	25	-	25	50	-
8.	PHN-608	Fiber and Nonlinear Optics	PEC	4	3	1	0	3	0	25	-	25	50	-
9.	PHN-610	Quantum Optics	PEC	4	3	1	0	3	0	25	-	25	50	-
10.	PHN-612	Advanced topics in Mathematical Physics	PEC	4	3	1	0	3	0	25	-	25	50	-
11.	PHN-614	Introduction to Superstring theory	PEC	4	3	1	0	3	0	25	-	25	50	-
12.	PHN-616	Advanced Electroceramics Technology	PEC	4	3	1	0	3	0	25	-	25	50	-
13.	PHN-617	Advanced Characterization Techniques	PEC	4	3	1	0	3	0	25	-	25	50	-
14.	PHN-618	Atomic and Molecular Collision Physics	PEC	4	3	1	0	3	0	25	-	25	50	-
15.	PHN-619	A Primer in Quantum Field Theory	PEC	4	3	1	0	3	0	25	-	25	50	-
16.	PHN-620	Advanced Quantum Field Theory	PEC	4	3	1	0	3	0	25	-	25	50	-
17.	PHN-621	Astrophysics	PEC	4	3	1	0	3	0	25	-	25	50	-
18.	PHN-622	Solar Terrestrial Physics	PEC	4	3	1	0	3	0	25	-	25	50	-
19.	PHN-623	General Relativity	PEC	4	3	1	0	3	0	25	-	25	50	-
20.	PHN-624	Computational Nuclear Physics	PEC	4	3	1	0	3	0	25	-	25	50	-
21.	PHN-625	Particle Physics	PEC	4	3	1	0	3	0	25	-	25	50	-
22.	PHN-626	Advanced Atomic and Molecular Physics	PEC	4	3	1	0	3	0	25	-	25	50	-
23.	PHN-627	Quantum Theory of Solids	PEC	4	3	1	0	3	0	25	-	25	50	-
24.	PHN-629	Weather Forecasting	PEC	4	3	1	0	3	0	25	-	25	50	-
25.	PHN-631	Nuclear Instrumentation	PEC	4	3	1	0	3	0	25	-	25	50	-
26.	PHN-633	Physics and Technology of Thin Films	PEC	4	3	1	0	3	0	25	-	25	50	-
27.	PHN-635	Advanced Nuclear reactions	PEC	4	3	1	0	3	0	25	-	25	50	-

28.	PHN-637	Semiconductor Photonics	PEC	4	3	1	0	3	0	25	-	25	50	-
29.	PHN-638	Advanced Light Sources	PEC	4	3	1	0	3	0	25	-	25	50	-
30.	PNN-639	Superconducting Radio Frequency for particle accelerators	PEC	4	3	1	0	3	0	25	-	25	50	-
31.	PHN-715	Analog Integrated Circuit Design	PEC	4	3	1	0	3	0	20-35	0	20-30	40-50	0
32.	PHN-717	Digital Signal Processing	PEC	4	3	1	0	3	0	20-35	0	20-30	40-50	0
33.	PHN-713	Optical Electronics	PEC	4	3	1	0	3	0	20-35	0	20-30	40-50	0

List of PECs (Physics): Solid State Electronic Materials

Teaching Scheme			Contact Hours/Week				Exam Duration (Hrs.)		Relative Weights (%)					
S. No.	Subject Code	Course Title	Subject Area	Credits	L	T	P	Theory	Practical	CWS	PRS	MTE	ETE	PRE
1.	PHN-715	Analog Integrated Circuit Design	PEC	4	3	1	0	3	0	20-35	0	20-30	40-50	0
2.	PHN-717	Digital Signal Processing	PEC	4	3	1	0	3	0	20-35	0	20-30	40-50	0
3.	PHN-713	Optical Electronics	PEC	4	3	1	0	3	0	20-35	0	20-30	40-50	0
1.	PHN-718	Thin Film Technology	PEC	4	3	1	0	3	0	20-35	0	20-30	40-50	0
2.	PHN-708	Materials for Renewable Energy and Storage	PEC	4	3	1	0	3	0	20-35	0	20-30	40-50	0
3.	PHN-722	Functional Properties of Materials & Devices	PEC	4	3	1	0	3	0	20-35	0	20-30	40-50	0
4.	PHN-721	Nanoscience and Nanotechnology	PEC	4	3	1	0	3	0	20-35	0	20-30	40-50	0
5.	PHN-723	Engineered materials for Device Application	PEC	4	3	1	0	3	0	20-35	0	20-30	40-50	0
6.	PHN-724	Semiconductor Micro-electronic Technology	PEC	4	3	1	0	3	0	20-35	0	20-30	40-50	0
7.	PHN-725	Nano-electronics and -photonics	PEC	4	3	1	0	3	0	20-35	0	20-30	40-50	0
8.	PHN-726	Solar Photovoltaic and Energy Storage	PEC	4	3	1	0	3	0	20-35	0	20-30	40-50	0
9.	PHN-727	Advance Fuel Cell and Battery Technology	PEC	4	3	1	0	3	0	20-35	0	20-30	40-50	0
10.	PHN-728	MEMS and NEMS	PEC	4	3	1	0	3	0	20-35	0	20-30	40-50	0
12.	PHN-729	Advanced Ceramics and Composites	PEC	4	3	1	0	3	0	20-35	0	20-30	40-50	0

List of PECs (Physics): Photonics

Teaching Scheme					Contact Hours/Week			Exam Duration (Hrs.)		Relative Weights (%)				
S. No.	Subject Code	Course Title	Subject Area	Credits	L	T	P	Theory	Practical	CWS	PRS	MTE	ETE	PRE
1.	PHN-709	Semiconductor Device Physics	PEC	4	3	1	0	3	0	20-35	0	20-30	40-50	0
2.	PHN-715	Analog Integrated Circuit Design	PEC	4	3	1	0	3	0	20-35	0	20-30	40-50	0
3.	PHN-717	Digital Signal Processing	PEC	4	3	1	0	3	0	20-35	0	20-30	40-50	0
1.	PHN-719	Radiation Detection and Measurements	PEC	4	3	0	3	3	0	10-25	25	15-25	30-40	0
2.	PHN-725	Nano-electronics and photonics	PEC	4	3	1	0	3	0	20-35	0	20-30	40-50	0
3.	PHN-726	Solar Photovoltaic and Energy Storage	PEC	4	3	1	0	3	0	20-35	0	20-30	40-50	0
4.	PHN-731	Optical Communication System	PEC	4	3	1	0	3	0	20-35	0	20-30	40-50	0
5.	PHN-732	Optical Networks	PEC	4	3	1	0	3	0	20-35	0	20-30	40-50	0
6.	PHN-733	Solid State Lighting	PEC	4	3	1	0	3	0	20-35	0	20-30	40-50	0
7.	PHN-734	Display Technology	PEC	4	3	1	0	3	0	20-35	0	20-30	40-50	0
8.	PHN-735	Photonic Sensors	PEC	4	3	1	0	3	0	20-35	0	20-30	40-50	0
9.	PHN-736	Photonic Analysis and Design	PEC	4	2	0	4	2	3	10-25	25	15-25	30-40	0
10.	PHN-737	Silicon Photonics	PEC	4	3	1	0	3	0	20-35	0	20-30	40-50	0
11.	PHN-738	Quantum Photonics	PEC	4	3	1	0	3	0	20-35	0	20-30	40-50	0

List of PECs (ECE): Microelectronics & VLSI

Teaching Scheme					Contact Hours/Week			Exam Duration		Relative Weight(%)				
S. No.	Subject Code	Course Title	Subj	Credits	L	T	P	Theory	Practical	CW	PR	MT	ETE	PRE
1	ECN-524	Power Electronic Devices, Circuits and Systems	PEC	4	3	1	0	3	0	20-35	-	20-30	40-50	-
2	ECN-525	Hardware Architecture for Deep- Learning	PEC	4	3	1	0	3	0	20-35	-	20-30	40-50	-
3	ECN-526	Statistical Machine Learning for Variation-Aware Electronic Device and Circuit Simulation	PEC	4	3	1	0	3	0	20-35	-	20-30	40-50	-
4	ECN-561	Compact Modeling of Semiconductor Devices	PEC	4	3	1	0	3	0	20-35	-	20-30	40-50	-
5	ECN-571	Semiconductor Device Modeling	PEC	4	3	1	0	3	0	20-35	-	20-30	40-50	-
6	ECN-572	MOS Device Physics	PEC	4	3	1	0	3	0	20-35	-	20-30	40-50	-
7	ECN-581	Analog VLSI Circuit Design	PEC	4	3	1	0	3	0	20-35	-	20-30	40-50	-
8	ECN-582	Semiconductor Microwave Devices & Applications	PEC	4	3	1	0	3	0	20-35	-	20-30	40-50	-
9	ECN-583	Optoelectronic Materials & Devices	PEC	4	3	1	0	3	0	20-35	-	20-30	40-50	-
10	ECN-584	Mixed Signal Circuit Design	PEC	4	3	1	0	3	0	20-35	-	20-30	40-50	-
11	ECN-585	VLSI System Design	PEC	4	3	1	0	3	0	20-35	-	20-30	40-50	-
12	ECN-586	Device & Circuit Interaction	PEC	4	3	1	0	3	0	20-35	-	20-30	40-50	-
13	ECN-587	Nano Scale Devices	PEC	4	3	1	0	3	0	20-35	-	20-30	40-50	-
14	ECN-588	Performance and Reliability of VLSI Circuits	PEC	4	3	1	0	3	0	20-35	-	20-30	40-50	-
15	ECN-589	Advanced VLSI Interconnects	PEC	4	3	1	0	3	0	20-35	-	20-30	40-50	-
16	ECN-590	Organic Electronics	PEC	4	3	1	0	3	0	20-35	-	20-30	40-50	-
17	ECN-591	VLSI Physical Design	PEC	4	3	1	0	3	0	20-35	-	20-30	40-50	-
18	ECN-592	Compound Semiconductors and RF Devices	PEC	4	3	1	0	3	0	20-35	-	20-30	40-50	-
19	ECN-593	CAD for VLSI	PEC	4	3	1	0	3	0	20-35	-	20-30	40-50	-
20	ECN-594	VLSI Digital Signal Processing	PEC	4	3	1	0	3	0	20-35	-	20-30	40-50	-
21	ECN-595	VLSI Testing and Testability	PEC	4	3	1	0	3	0	20-35	-	20-30	40-50	-
22	ECN-596	MEMS and NEMS	PEC	4	3	1	0	3	0	20-35	-	20-30	40-50	-
23	ECN-597	MicroelectronicsLab.-2	PEC	2	-	-	2	-	-	-	100	-	-	-
24	ECN-598	SimulationLab.-2	PEC	2	-	-	2	-	-	-	100	-	-	-
List of PECs (ECE): Terahertz Communication and Sensing														
25	ECN-554	Microwave and Millimeter-Wave Circuits	PEC	4	3	1	0	3	0	20-35	-	20-30	40-50	-
26	ECN-603	Millimeter-Wave & Terahertz Antenna Design	PEC	4	3	1	0	3	0	20-35	-	20-30	40-50	-
27	ECN-604	High Speed Semiconductor Devices	PEC	4	3	1	0	3	0	20-35	-	20-30	40-50	-
28	ECN-605	Surface Electromagnetics	PEC	4	3	1	0	3	0	20-35	-	20-30	40-50	-
29	ECN-637	Microwave Photonic ICs	PEC	4	3	1	0	3	0	20-35	-	20-30	40-50	-

