19 March 2025

Course Template PhD

A) For students with M.Tech. background

Courses	Semester →	1	2	Summer Term	3	4
		SEE-601* [9]	**SEE-604* [9]**		SEE799 [36]	SEE799 [36]
		SEE-602* [9]	**SEE-605** [9]**	0-2 Research Units (SEE799)[#]		
		SEE-603* [9]	**SEE-612* [9]**			
		SEE-609[*,&] [9]	**SEE-801/802[**][0]**			
		SEE-888[**][3]	2-3 DE [18-27]		**SEE-801/802[**][0]**	
		2-3 DE [18-27]	0-1 OE[$] [0-9]			
		0-1 OE[$] [0-9]	0-2 Research units (SEE799)			
	Credits →	36+3	36	[18][#]	36	36
					Min. Total Credits (PG)	**144+3**

1) Total number of courses: 6 for students from 2025 batch and onwards.
2) *A student must take 2 courses from the core basket.
3) **Compulsory course. The 3 credits from SEE 888 on top of the minimum course requirements.
4) [&,$]Refer to the open elective course basket for more details.
5) [#]Summer research credits (recommended).
6) A student should take at least 2 DE's and the remaining OE's.

B) For students with B.Tech./M.Sc. background

	Semester →	1	2	Summer Term	3	4
Courses		**SEE-601* [9]**	**SEE-604* [9]**		SEE799 [18]	SEE799 [36]
		SEE-602* [9]	**SEE-605** [9]**	0-2 Research Units (SEE799)[#]		
		SEE-603* [9]	**SEE-609*[,&] [9]**		**SEE-801/802[**][0]**	
		SEE-612* [9]	**SEE-801/802[**][0]**		0-2 DE [0-18]	
		SEE-888[**] [3]	0-3 DE [0-27]		0-2 OE [0-18]	
		2-3 DE [18-27]	0-2 OE[$] [0-18]			
		0-1 OE[$] [0-9]	0-2 Research units (SEE799)			
	Credits →	36+3	36	[18][#]	36	36
					Min. Total Credits (PG)	**144 + 3**

1) Total number of courses: 6 for students from 2025 batch and onwards.
2) * Core basket course, a student must take **2** such courses.
3) **Compulsory course. The 3 credits from SEE-888 (Introduction to Profession and Communication) on the top of minimum course requirements.
4) [&,$]Refer to the open elective course basket for more details.
5) [#] Summer research credits (recommended)
6) A student should take at the least 3 DE's and the remaining OE's.

Department Electives (DE)	
SEE-606: Electrochemical Energy Systems	SEE-621: Biomass Conversion and Biorefineries
SEE-607: Hydrogen Energy: Production, Storage and Utilization	SEE-622A: Sustainable Energy- Enabling Net Zero Emissions
SEE-608: Introduction to Bioenergy and Biofuels	SEE-623: Fuel Cell Electrical Energy Systems
SEE-610: Introduction to Materials Modelling and Simulations	SEE-624A: Design Strategies for Net-Zero Energy Buildings
SEE-611: Energy Systems: Modelling and Analysis	SEE-625: Structural, Microstructural and Spectroscopic Characterization of Materials
SEE-612: Manufacturing of Energy Systems	SEE-626M: Ecological Principles and Biodiversity for Sustainability
SEE 613: Solar Photovoltaics	SEE-628: Policy Processes and Analytical Methods: Application to Climate Policies
SEE-614: Wind Energy	SEE-629M: Ecology, Equity and the Economy
SEE-615: Solar Thermal Engineering	SEE-631 Sustainable Forest Management
SEE-616: Renewables Integrated Smart Power Systems	SEE-632: Heating, Ventilation, and Air-Conditioning of Buildings
SEE-617: Introduction to Sustainable Energy Policy	SEE-633: Power Electronics for Electric Vehicles
SEE-618A: Energy Efficient Building Design	SEE-634: Critical Material Resources for Clean Energy Transition
SEE-619: Finite Volume Methods for Engineers	
SEE-620A: Heat Driven Cooling Systems	Any other SEE [3-0-0-9] courses that will be added later.
Open Electives (OE)	
EE698E: Power Converters for EV Charging	CHE642A: Numerical Methods^
EE662: Control Techniques in Power Electronics	ME685A: Applied Numerical Methods^
EE698A: EMI/EMC in Power Electronics	AE603: Introduction to Scientific Computing^
EE798A: Design, Operation, and Control of Microgrids	CHE622A: Molecular Simulations^
EE630A: Simulations of Power Systems	ChE626A: Practical Introduction to Quantum Mechanical Methods for Scientists and Engineers^
EE660A: Basics of Power Electronic Converters	MBA681A: Energy and Carbon Markets: Economics, Policy and Regulation
EE631A: Advanced Power System Stability	MBA782A: Renewable Energy - Economics, Policy and Regulation
ME743: Fuel Cells	MBA683A: Power Sector Reform and Regulation
MSE673: Fundamentals and Applications of Electrochemistry	Any other 600 level or higher-level course in the institute of minimum 9 credits

[&],[$]Students can take one of these courses if they have not credited SEE 609 [9] earlier.
(i.e. Students can take ONLY one of the following four: CHE642A, ME685A, AE603, SEE-609 and ONLY one of the following two: CHE622A, ChE626A).

Minimum credit requirement for Ph.D.

Background→	M.Tech.	B.Tech./M.Sc.
Coursework	54 (36 + 18[$])	72
Thesis	90 (108-18[$])	126(144-18[$])
Total	144+3[$$]	216 + 3[$$]

[$]Applicable for the admitted students from 2025 and onwards.

[$$]SEE 888 [3] (Introduction to Profession and Communication) course is on top of the minimum course requirements.