

## Course Template PhD

### A) For students with M.Tech. background

Courses	Semester →	1	2	Summer Term	3	4
			<b>SEE-601* [9]</b>	<b>SEE-604* [9]</b>		SEE799 [36]
		<b>SEE-602* [9]</b>	<b>SEE-605** [9]</b>	0-2 Research Units (SEE799) <sup>#</sup>		
		<b>SEE-603* [9]</b>	<b>SEE-612* [9]</b>			
		<b>SEE-609*,&amp; [9]</b>	<b>SEE690/691**[0]</b>			
		<b>SEE888**[3]</b>	2-3 DE [18-27]		<b>SEE690/691**[0]</b>	
		2-3 DE [18-27]	0-1 OE <sup>\$</sup> [0-9]			
		0-1 OE <sup>\$</sup> [0-9]	0-2 Research units (SEE799)			
	<b>Credits →</b>	36+3	36	[18] <sup>#</sup>	36	36
					<b>Min. Total Credits (PG)</b>	<b>144+3</b>

- 1) Total number of courses: 6 for students from 2023 batch and onwards.
- 2) \*A student must take two courses from the core basket.
- 3) \*\*Compulsory course. The 3 credits from SEE 888 on the top of minimum course requirements.
- 4) &.\$Refer to the open elective course basket for more details.
- 5) <sup>#</sup>Summer research credits (recommended).
- 6) A student should take at the least 2 DE's.

**Note:** SEE 616 [9] was designated as a core course ONLY for students' of 2022 batch. However, those who have already taken SEE 603 are exempted from SEE 616 as core/compulsory. This course is now designated as an elective for students' of 2023 batch and onwards.

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

Courses	Semester →	1	2	Summer Term	3	4
			<b>SEE-601*</b> [9]	<b>SEE-604*</b> [9]		SEE799 [18]
		<b>SEE-602*</b> [9]	<b>SEE-605**</b> [9]	0-2 Research Units (SEE799) <sup>#</sup>		
		<b>SEE-603*</b> [9]	<b>SEE-609*,&amp;</b> [9]		<b>SEE690/691**</b> [0]	
		<b>SEE-612*</b> [9]	<b>SEE690/690**</b> [0]		0-2 DE [0-18]	
		<b>SEE888**</b> [3]	0-3 DE [0-27]		0-2 OE [0-18]	
		2-3 DE [18-27]	0-2 OE <sup>\$</sup> [0-18]			
		0-1 OE <sup>\$</sup> [0-9]	0-2 Research units (SEE799)			
	<b>Credits →</b>	36+3	36	[18] <sup>#</sup>	36	36
					<b>Min. Total Credits (PG)</b>	<b>144 + 3</b>

- 1) Total number of courses: 10 for students from 2023 batch and onwards.
- 2) \* Core basket course, a student must take **three** such courses.
- 3) \*\*Compulsory course. The 3 credits from SEE 888 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 4 DE's.

**Note:** SEE 616 [9] was designated as a core course ONLY for students' of 2022 batch. However, those who have already taken SEE 603 are exempted from SEE 616 as core/compulsory. This course is now designated as an elective for students' of 2023 batch and onwards.

<b>Department Electives (DE)</b>	
SEE-606: Electrochemical Energy Systems	SEE-617: Introduction to sustainable energy policy
SEE-607: Hydrogen Energy: Production, Storage and Utilization	SEE-618: Energy Efficient Building Design
SEE-608: Introduction to Bioenergy and Biofuels	SEE-619A: Finite Volume Methods for Engineers
SEE-610: Introduction to Materials Modelling and Simulations <sup>§</sup>	SEE-620A: Heat Driven Cooling Systems
SEE-611: Energy Systems: Modelling and Analysis	SEE-621A: Biomass Conversion and Biorefineries
SEE-612: Manufacturing of energy systems	SEE-622: Sustainable Energy- Enabling Net Zero Emissions
SEE 613: Solar Photovoltaics	SEE-623: Fuel Cell Electrical Energy Systems
SEE-614: Wind Energy	SEE-624: Design Strategies for Net-Zero Energy Buildings
SEE-615: Solar Thermal Engineering	Any other SEE [3-0-0-9] courses that will be added later.
<b>SEE-616: Essential Electrical Engineering for Renewables Integration</b> <sup>^</sup>	
<b>Open Electives (OE)</b>	
EE698D: Smart Grid Technology	CHE642A: Numerical Methods <sup>&amp;</sup>
EE630A: Simulations of Power Systems	ME685A: Applied Numerical Methods <sup>&amp;</sup>
EE660A: Basics of Power Electronic Converters	AE603: Introduction to Scientific Computing <sup>&amp;</sup>
EE631A: Advanced Power System Stability	CHE622A: Molecular Simulations <sup>§</sup>
MSE673: Fundamentals and Applications of Electrochemistry	ChE626A: Practical Introduction to Quantum Mechanical Methods for Scientists and Engineers <sup>§</sup>
ME743: Fuel Cells	Any other department's PG courses of minimum 9 credits

<sup>&</sup>,<sup>§</sup>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 set: CHE642A, ME685A, AE603, SEE-609 and ONLY one of the following two: CHE622A, ChE626A).

<sup>^</sup> Designated as an elective only for the students admitted in May-July 2023.

### Minimum credit requirement for Ph.D.

Background→	M.Tech.	B.Tech./M.Sc.
Coursework	54 (36 + 18 <sup>§</sup> )	90 (72 + 18 <sup>§</sup> )
Thesis	90 (108-18 <sup>§</sup> )	126(144-18 <sup>§</sup> )
<b>Total</b>	<b>144+3<sup>§§</sup></b>	<b>216 + 3<sup>§§</sup></b>

<sup>§</sup>Applicable for the admitted students from 2023 and onwards.

<sup>§§</sup>SEE 600 [3] course is on top of the minimum course requirements.