

**STUDY
and
EVALUATION SCHEME**

**MASTER OF ENGINEERING
IN
ELECTRICAL ENGINEERING
(INSTRUMENTATION & CONTROL)**

**REGULAR
(2024 – 2026)**



ELECTRICAL ENGINEERING DEPARTMENT
**NATIONAL INSTITUTE OF TECHNICAL TEACHERS TRAINING &
RESEARCH**

(Deemed to be University under Distinct Category)

CHANDIGARH

September 2024

STUDY & EVALUATION SCHEME

SESSION 2024-26

M.E. ELECTRICAL ENGINEERING (INSTRUMENTATION & CONTROL)

PROGRAM CODE:NC24S0621R

REGULAR PROGRAMME (Total Hours = 1800)

FIRST SEMESTER

SUBJECT CODE	SUBJECT	SCHEDULE FOR TEACHING			CREDITS	MARKS		
		L	P	TOTAL		Internal Assessment	University Examination	TOTAL
As per subject chosen	Program Core – I	4	-	4	4	50	50	100
As per subject chosen	Program Core – II	4	-	4	4	50	50	100
As per subject chosen	Program Core – III	4	-	4	4	50	50	100
As per subject chosen	Program Elective – I	3	-	3	3	50	50	100
As per subject chosen	Program Elective – II	3	-	3	3	50	50	100
062161	Lab – I	-	6	6	3	50	-	50
062171	Research Seminar – I	-	2	2	1	50	-	50
OCA [#]		-	-	4	-	-	-	-
SEMESTER TOTAL:				30	22	350	250	600

[#] **Out of Class Activities:** Preparing Assignments, Seminar preparation, PPT preparation, Literature Survey, Library, Self Study etc.

SECOND SEMESTER

SUBJECT CODE	SUBJECT	SCHEDULE FOR TEACHING			CREDITS	MARKS		
		L	P	TOTAL		Internal Assessment	University Examination	TOTAL
As per subject chosen	Program Core – IV	4	-	4	4	50	50	100
As per subject chosen	Program Core – V	4	-	4	4	50	50	100
As per subject chosen	Program Elective – III	3	-	3	3	50	50	100
As per subject chosen	Program Elective – IV	3	-	3	3	50	50	100
062162	Lab – II	-	6	6	3	50	-	50
062172	Research Seminar – II	-	2	2	1	50	-	50
OCA [#]		-	-	8	-	-	-	-
SEMESTER TOTAL:				30	18	300	200	500

[#] **Out of Class Activities:** Preparing Assignments, Seminar preparation, PPT preparation, Literature Survey, Library, Self Study etc.

THIRD SEMESTER

SUBJECT CODE	SUBJECT	SCHEDULE FOR TEACHING			CREDITS	MARKS		
		L	P	TOTAL		Internal Assessment	University Examination	TOTAL
052071	Research Methodology	4	-	4	4	50	50	100
As per subject chosen	OEC/SEC/AEC-I	3	-	3	3	50	50	100
As per subject chosen	OEC/SEC/AEC-II	3	-	3	3	50	50	100
062163	Preliminary Thesis ^{##}	-	15	15	10	-	-	-
OCA [#]		-	-	5	-	-	-	-
SEMESTER TOTAL:				30	20	150	150	300

[#] **Out of Class Activities:** Preparing Assignments, Seminar preparation, PPT preparation, Literature Survey, Library, Self Study etc.

^{##} *For Preliminary Thesis, Satisfactory ('S') OR Unsatisfactory ('X') grade will be awarded.*

FOURTH SEMESTER

SUBJECT	SUBJECT	SCHEDULE FOR TEACHING			CREDITS	MARKS		
		L	P	TOTAL		Internal Assessment	University Examination	TOTAL
062164	Thesis	-	30	30	20	100*	100	200**
	* Internal assessment is based on the following criterion:							
	Grade	Condition						
	A+	Publication from Thesis in SCI indexed journal						
	A	Publication from Thesis in Scopus indexed journal						
	B+	Publication from Thesis in UGC Care journal OR Scopus indexed conference proceedings						
	B	Publication from Thesis in International Conference						
	C+	Publication from Thesis in National Conference						
	** Final Grade will be average of the grades of internal assessment and university viva-voce examination							

PROGRAM TOTAL CREDITS = 80

NOTES:

1. Requirement for the award of **ME Electrical Engineering (Instrumentation & Control) degree** is 80 credits with minimum CGPA of 6.0
2. **Post-Graduate Diploma in Electrical Engineering (Instrumentation & Control)** will be awarded to those who exit after successful completion of First and Second Semester (MINIMUM 40% CREDITS)
3. The students will study a minimum of 2 and a maximum of 5 SWAYAM/NPTEL courses during the program subject to the selected SWAYAM-NPTEL course meeting the credit requirement of the program. For SWAYAM-NPTEL courses the students will take the NPTEL exam and submit the certificate for credit transfer.

COURSE BASKETS

SEMESTER-I

Three PROGRAM CORE COURSES (PCC) from the following list to be studied in the first semester

SUBJECT CODE	SUBJECT NAME	CREDITS
062101	Digital Signal Processing	4
062102	Energy Management	4
062103	IoT Enabled Industrial Automation	4
062104	Smart Grid: Basics to Advanced Technologies	4
062105	Opto-Electronic Instrumentation	4

Two PROGRAM ELECTIVE COURSES (PEC) from the following list to be studied in the first semester

SUBJECT CODE	SUBJECT NAME	CREDITS
062121	Process Dynamics and Control	3
062122	Advanced Control Theory	3
062123	PLC and Micro controller	3
062124	State Space Approach to Control System Analysis and Design	3
062125	Instrumentation for Environmental Engineering	3
062126	Virtual Instrumentation	3
062127	Bio-Medical Instrumentation and Sensors	3
062128	Introduction to Electric Vehicles and Hybrid Electric Vehicles	3
062129	Power Electronics	3
062130	Power Quality	3
062131	Power System Analysis	3
062132	Energy Regulation and Pricing	3
062133	Measurement Sciences and Techniques	3
062134	Soft Computing Techniques	3
062135	Sensors and Actuators	3
	Any other relevant course available on SWAYAM/NPTEL	3

SEMESTER-II

Two PROGRAM CORE COURSES (PCC) from the following list to be studied in the second semester

SUBJECT CODE	SUBJECT NAME	CREDITS
062101	Digital Signal Processing	4
062102	Energy Management	4
062103	IoT Enabled Industrial Automation	4
062104	Smart Grid: Basics to Advanced Techonoloies	4
062105	Opto-Electronic Instrumentation	4

Two PROGRAM ELECTIVE COURSES (PEC) from the following list to be studied in the second semester

SUBJECT CODE	SUBJECT NAME	CREDITS
062121	Process Dynamics and Control	3
062122	Advanced Control Theory	3
062123	PLC and Micro controller	3
062124	State Space Approach to Control System Analysis and Design	3
062125	Instrumentation for Environmental Engineering	3
062126	Virtual Instrumentation	3
062127	Bio-Medical Instrumentation and Sensors	3
062128	Introduction to Electric Vehicles and Hybrid Electric Vehicles	3
062129	Power Electronics	3
062130	Power Quality	3
062131	Power System Analysis	3
062132	Energy Regulation and Pricing	3
062133	Measurement Sciences and Techniques	3
062134	Soft Computing Techniques	3
062135	Sensors and Actuators	3
	Any other relevant course available on SWAYAM/NPTEL	3

SEMESTER – III

A total of **Two** Courses from the following lists of OEC, SEC & AEC to be studied in the third semester.

OPEN ELECTIVE COURSES (OEC)*

SUBJECT CODE	SUBJECT	CREDITS
102141	A Primer to Mathematical Optimization	3
102142	Optimization Theory and Algorithms	3
102143	Problem Solving Through Programming in C	3
102144	Programming in Modern C++	3
102145	Introduction to Machine Learning	3
102146	Cloud Computing	3
102147	Introduction to Industry 4.0 and Industrial Internet of Things	3

SKILL ENHANCEMENT COURSES (SEC)*

SUBJECT CODE	SUBJECT	CREDITS
102165	Entrepreneurship	3
102166	Understanding Incubation and Entrepreneurship	3
102167	Patent Law for Engineers and Scientists	3
102168	Advanced Contracts, Tendering and Public Procurement	3
102169	Science Communication: Research Productivity and Data Analytics using Open-Source Software	3

ABILITY ENHANCEMENT COURSES (AEC)*

SUBJECT CODE	SUBJECT	CREDITS
102181	Environmental Science	3
102182	Soft Skills	3

*** Any other relevant course in addition to the above listed OEC, SEC and AEC courses may be added from time to time.**