WALCHAND INSTITUTE OF TECHNOLOGY, SOLAPUR
(AN AUTONOMOUS INSTITUTE)

Affiliated to
Punyashlok Ahilyadevi Holkar Solapur University, Solapur

CHOICE BASED CREDIT SYSTEM (CBCS)

Syllabus
for
M. Tech. in Electronics Engineering- Sem-III & IV

SCHEME-24

F. Y. M. Tech. Electronics Engineering W.E.F. 2024-25
S. Y. M. Tech. Electronics Engineering W.E.F. 2025-26

Legends Used	
L	Lecture Hours / week
T	Tutorial Hours / week
P	Practical Hours / week
FA	Formative Assessment
SA	Summative Assessment
ESE	End Semester Examination
ISE	In Semester Evaluation
ICA	Internal Continuous Assessment
POE	Practical and Oral Exam
OE	Oral Exam
MOOC	Massive Open Online Course
HSS	Humanity and Social Science
NPTEL	National Programme on Technology Enhanced Learning
F.Y.	First Year
S.Y.	Second Year
T.Y.	Third Year
B. Tech.	Bachelor of Technology

Course Code Format						
C	**S**	**U/P**	**2**	**C**	**C**	**1**
Program Code		U-Undergraduate, P-Post Graduate	Semester No. / Year 1/2/3/4	Course Type		Course Serial No. 1-9

Program Code	
EE	M. Tech Electronics Engineering
Course Type	
CC	Core Compulsory Course
EN*	Core Elective N* indicates the serial number of electives offered in the respective category
ON* Open Elective	N* indicates the serial number of electives offered in the respective category
SM	Seminar
DS	Dissertation
IN	Internship

Sample Course Code	
EEP1CC1	Advanced Embedded System Design

Walchand Institute of Technology, Solapur
Department of Electronics Engineering
M. Tech.- Electronics Engineering
Structure - (Scheme 24)

Semester I

Course Code	*Name of the Course*	*Engagement Hours*			*Credits*	*SA*	*FA*		*Total*
		L	T	*P*		*ESE*	*ISE*	*ICA*	
EEP1CC1	Advanced Embedded System Design	3	-	2	4	60	40	25	125
EEP1CC2	Machine Learning	3	-	2	4	60	40	25	125
EEP1CC3	Advanced Communication Networks and Protocols	3	-	-	3	60	40	-	100
CMP1RM	Research Methodology and IPR	3	1	-	4	60	40	25	125
EEP1CE1N*	Core Elective- I	3	-	-	3	60	40	-	100
EEP1SM1	Seminar-1			4	2	-	-	50	50
	Total	**15**	**1**	**8**	**20**	**300**	**200**	**125**	**625**

N* indicates course serial number of elective offered in the respective category

Course Code	*Name of the Course*	*Engagement Hours*			*Credits*	*SA*	*FA*		*Total*
		L	T	*P*		*ESE*	*ISE*	*ICA*	
CMP1AC	Yoga for Stress Management	2	-	-	-	-	50	-	50

Core Elective-I

Course Code	Course Title
EEP1CE11	Wireless sensor networks
EEP1CE12	Analog and Digital CMOS VLSI Design
EEP1CE13	Image and Video Processing

Semester II

Course Code	*Name of the Course*	*Engagement Hours*			*Credits*	*SA*	*FA*		*Total*
		L	T	*P*		*ESE*	*ISE*	*ICA*	
EEP2CC4	Advanced Internet of Things (IoT)	3	-	2	4	60	40	25	125
EEP2CC5	Sensors and Actuators	3	-	2	4	60	40	25	125
EEP2CC6	Wireless cellular and LTE 4G	3	-	-	3	60	40	-	125
EEP2CE2N*	Core Elective-II	3	-	-	3	60	40	-	100
EEP2CE3N*	Core Elective-III	3	-	-	3	60	40	-	100
EEP2SM2	Seminar-2	-	-	6	3	-	-	100	100
Sub Total		**15**	**-**	**10**	**20**	**300**	**200**	**150**	**650**

N indicates course serial number of elective offered in the respective category*

Core Elective-II

Course Code	Course Title
EEP2CE21	Advanced Machine Learning
EEP2CE22	Web and Deep Data Mining
EEP2CE23	Deep Learning for Computer Vision

Core Elective-III

Course Code	Course Title
EEP2CE31	Network and Internet Security
EEP2CE32	Neural Networks & Fuzzy Control Systems
EEP2CE33	Advanced Control Systems

Note: -For Open Elective course, students should enrol for one of the minimum 8 weeks duration course offered by SWAYAM / NPTEL platform. They should complete its assignments and appear for certificate examination conducted by SWAYAM / NPTEL. Students should pass the examination till the end of Semester IV. Based on the marks obtained in the assignments and examination; credits will be transferred in Semester IV. The list of courses will be provided by the Board of Studies.

Semester III

Course Code	*Name of the Course*	*Engagement Hours*			*Credits*	*SA*	*FA*		*Total*
		L	T	*P*		*ESE*	*ISE*	*ICA*	
CMP3IK	Indian Science and Technology	2	-	-	2	-	50	-	50
EEP3IN	Internship	-	-	-	3	-	-	100	100
EEP3DS1	Dissertation Phase-I	-	-	30	15	-	200	150	350
Total		**2**	**-**	**30**	**20**		**250**	**250**	**500**

Note: -*Students must compulsorily undergo internship of one month after the Semester-II (in the summer vacation). The evaluation of the same will be carried out at the end of semester – III.*

Semester IV

Course Code	*Name of the Course*	*Engagement Hours*			*Credits*	*SA*	*FA*		*Total*
		L	*T*	*P*		*ESE/ OE*	*ISE*	*ICA*	
CMP4OE1N*	Open Elective (SWAYAM/NPTEL MOOC)#	-	-	-	4	-	-	-	-
EEP4DS2	Dissertation Phase –II	-	-	32	16	200	-	200	400
Total		**-**	**-**	**32**	**20**	**200**	**-**	**200**	**400**

N* indicates course serial number of elective offered in the respective category

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M. Tech. (Electronics Engineering) Semester-III

CMP3IK- INDIAN SCIENCE AND TECHNOLOGY

Teaching Scheme:	**Examination Scheme**
Lectures- 2 Hours / week, 2Credits	**ISE- 50 Marks**

Course Outcomes:-

At the end of this course, students will be able

1. Aware of the true history and rich culture of India
2. To explain the scientific value of the traditional knowledge of India
3. To appreciate the knowledge of Metallurgy, Textile Chemistry & Pyro Technology in IKS
4. To elaborate Indian knowledge of Water Management and transportation systems
5. To describe the contribution of IKS in Mathematics & Astronomy
6. To describe the concepts of IKS in Ecology and Environment

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Unit 1 Fundamentals **(4)**

An overview of Indian contributions to technology. Technological Innovations.

Unit 2 Metallurgy, Textile Chemistry & Pyro Technology **(5)**

Copper/Bronze/Zinc: Important Mines (Zawar, Khetri mines), Iron and Wootz Steel Technology, Textile and Dyeing- Indian Specialities (Kutchi Embroidery, Cotton Textile etc.), Ceramic Technology, Stone (Lapidary), Shell, Ivory, Faience & Glass Technology

Unit 3 Water Management & Transportation **(5)**

Harappan and Traditional Water Management System of Gujarat, Historical Sites- Sringeverpur, South Indian Water Management System, Western Ghats Cave- Kanheri, etc.,
Communities Involved in Water Management, Modes of Transportations and Reforms, Grand Trunk Road (Uttarapath & Dakshinapath), Development of Trading Techniques, Boat & Ship Building

Unit 4 Mathematics & Astronomy **(5)**

Mathematics contained in the Sulbasutra, Weaving Mathematics into Beautiful Poetry- Bhaskaracarya, The Evolution of Sine Function in India, The Discovery of Calculus by Kerala Astronomers, Vedanga Jyotish & Measuring Time & Calendar

Unit 5 Ecology and Environment **(5)**

Nakshatrara Gyaan and Agriculture, Vernacular Architecture, Forest Management and Urban Planning, Agroforestry, Tank, Lakes, and Stepwells

Unit 6 India's Contribution in Science and Technology to the World **(4)**

Text Book:

1. Introduction To Indian Knowledge System: Concepts And Applications Mahadevan, B. · Bhat, Vinayak Rajat · Nagendra Pavana R.N. Apr 2022 · Phi Learning Pvt. Ltd.

References books

1. R.M. Pujari, Pradeep Kolhe, N. R. Kumar, 'Pride of India: A Glimpse into India's Scientific Heritage', Samskrita Bharati Publication.
2. Indian Contribution to Science', compiled by Vijnana Bharati.
3. 'Knowledge traditions and practices of India', Kapil Kapoor, Michel Danino, CBSE, India.
4. Dr. Subhash Kak , Computation in Ancient India,Mount, Meru Publishing (2016)
5. Dharampal, *Indian Science and Technology in the Eighteenth Century,* Academy of Gandhian Studies, Hyderabad, 1971, republic. Other India Bookstore, Goa, 2000
6. Robert Kanigel, *The Man Who Knew Infinity: A Life of the Genius Ramanujan*, Abacus, London, 1999
7. Alok Kumar, *Sciences of the Ancient Hindus: Unlocking Nature in the Pursuit of Salvation*, CreateSpace Independent Publishing, 2014
8. B.V. Subbarayappa, *Science in India: A Historical Perspective,* Rupa, New Delhi, 2013
9. S. Balachandra Rao, *Indian Mathematics and Astronomy: Some Landmarks*, Jnana Deep Publications, Bangalore, 3rd edn, 2004
10. S. Balachandra Rao, *Vedic Mathematics and Science in Vedas,*Navakarnataka Publications, Bengaluru, 2019
11. Bibhuti bhushan Datta, *Ancient Hindu Geometry: The Science of the Śulba,* 1932, repr. Cosmo Publications, New Delhi, 1993
12. Bibhuti bhushan Datta & Avadhesh Narayan Singh, *History of Hindu Mathematics*, 1935, repr. Bharatiya Kala Prakashan, Delhi, 2004
13. George Gheverghese Joseph, *The Crest of the Peacock,* Penguin Books, London & New Delhi, 2000
14. J. McKim Malville &Lalit M. Gujral, *Ancient Cities, Sacred Skies: Cosmic Geometries and City Planning in Ancient India*, IGNCA & Aryan Books International, New Delhi, 2000).
15. Clemency Montelle, *Chasing Shadows: Mathematics, Astronomy and the Early History of Eclipse Reckoning*, Johns Hopkins University Press, 2011
16. Anisha Shekhar Mukherji, *Jantar Mantar: Maharaja Sawai Jai Singh's Observatory in Delhi,*
17. AMBI Knowledge Resources, New Delhi, 2010
18. Thanu Padmanabhan, (ed.), *Astronomy in India: A Historical Perspective,* Indian National Science Academy, New Delhi & Springer (India), 2010
19. AcharyaPrafulla Chandra Ray, *A History of Hindu Chemistry*, 1902, republ., Shaibya Prakashan Bibhag, centenary edition, Kolkata, 2002
20. R. Balasubramaniam, *Delhi Iron Pillar: New Insights*, Indian Institute of Advance Study, Shimla & Aryan Books International, New Delhi, 2002
21. R. Balasubramaniam, *Marvels of Indian Iron through the Ages*, Rupa& Infinity Foundation, New Delhi, 2008

22. Anil Agarwal & Sunita Narain, (eds), *Dying Wisdom: Rise, Fall and Potential of India's Traditional Water-Harvesting Systems*, Centre for Science and Environment, New Delhi, 1997
23. Fredrick W. Bunce:*The Iconography of Water: Well and Tank Forms of the Indian Subcontinent,* DK Printworld, New Delhi, 2013

e- Resource : https://onlinecourses.swayam2.ac.in/arp19_ap87/preview

Walchand Institute of Technology, Solapur

M. Tech. (Electronics Engineering) Semester-III

EEP3IN- INTERNSHIP

Examination Scheme
3 Credits, ICA- 100 Marks

The objective of internship is to give exposure to the students to industry environment and practices. Students are expected to undergo rigorous training for a minimum period of one month after semester-II at relevant IT organizations / engineering organizations / research laboratories / design and consultancy organizations.

Assessment

1. The assessment is based on ICA. The panel of minimum two faculty members from the department shall assess the student for the internship.
2. The students are expected to present the work done in an internship tenure.
3. The students shall also submit a detailed report based on activities done in internship and learnings through the same.
4. The students shall also submit the duly signed internship certificate from the organization/s where the internship is done, clearly indicating the period of internship.

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M. Tech. (Electronics Engineering) Semester-III

EEP3DS1- Dissertation Phase-I

Teaching Scheme:
Practical – Total 30 Hours , 15 Credits

Examination Scheme
ISE- 200 Marks
ICA- 150 Marks

Deliverables-

1. Recognize the importance of planning and preparation required to undertake a research project
2. Search the existing literature and identification of research problem
3. Design and develop the solution for complex engineering problem
4. Demonstrate the ability to collect and critically assess/interpret the data
5. Demonstrate the ability to convey knowledge effectively using precise and scientifically appropriate communication methods

The student is expected to-

1. carry out independent research work that includes an exhaustive literature survey, identification of research gaps, and formulation of a clear research problem to be addressed.
2. submit synopsis based on which his/her chosen research problem.
3. regularly communicate the progress of the dissertation work to the supervisor and submit a detailed progress report at the end of the semester.

Guidelines for evaluation

Sr. No.	Activity	Assessment Period	Marks
1	1. Selection of dissertation topic 2. Preparation and submission of synopsis on selected research problem	within 30 days from the commencement of Semester III	100
2	Dissertation progress presentation	Last week of the second month of Semester III	100
3	Dissertation progress report submission and presentation	At the end of Semester	

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M. Tech. (Electronics Engineering) Semester-III

CMP4OE1N*- Open Elective (SWAYAM/NPTEL MOOC)

Teaching Scheme:
4 Credits

Guidelines-

1. **Course selection-** The student should enroll for one of the minimum 8 weeks duration courses offered by SWAYAM / NPTEL platform based on the list approved and provided by the board of studies (BOS) of the department.

2. **Course Registration and Completion-** The student must register for the selected course and complete all associated assignments, quizzes, and activities as mandated by the platform (SWAYAM / NPTEL / MOOC).

3. **Examination and Credit Transfer:** The student must register for the final examination proctored by the respective platform. The student should pass the examination for selected course before the end of Semester IV. After submission of the official scorecard appropriate credits will be transferred in Semester IV .

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M. Tech. (Electronics Engineering) Semester-IV

EEP4DS2- Dissertation Phase-II

Teaching Scheme:
Practical – Total 32 Hours , 16 Credits

Examination Scheme
ICA- 200 Marks
OE- 200 Marks

Deliverables:

1. Recognize the importance of planning and preparation required to undertake a research project
2. Extend the research work to a standardized level that can give solutions to real life problems.
3. Demonstrate the ability to collate and critically assess/interpret data
4. Develop an ability to effectively communicate knowledge in a scientific manner

Students are expected to -

1. complete most of the experimental /computation work and analysis of the results so obtained results as proposed in the synopsis
2. submit the dissertation work report in hard bound form mentioning the work carried out including literature review, problem definition and formulation, adopted methodology, results and discussion, conclusions, and the relevance of the work for future research
3. publish their dissertation work in relevant reputed journal/conference.
4. appear viva voce examination consists of a presentation and demonstration of the work carried out.