JSS MAHAVIDYAPEETHA

JSS SCIENCE AND TECHNOLOGY UNIVERSITY

SRI JAYACHAMARAJENDRA COLLEGE OF ENGINEERING, MYSURU

Scheme of Teaching and Examination 2020-21

Outcome Based Education (OBE) and Choice Based Credit System (CBCS)

(Effective from the academic year 2020-21)

SCHEME OF TEACHING AND EXAMINATION FOR B.E (ENVIRONMENTAL ENGINEERING)

SEMESTER: III

Sl. No	Subject code	Course title	Category Code	Teaching Department	QP Setting Dept.	Contact hours				CREDITS	Marks			Exam duration in hrs.
						L	T	P	TOTAL		CIE	SEE	Total	
1	**20MA311**	Engineering Mathematics - III	BSC	Mathematics	Maths	3	0	0	3	3	50	50	100	03
	20MATDIP310	Advanced Mathematics - I	BSC	Mathematics	Maths	3	0	0	3	0	00	50	50	03
2	**20EV310**	Elements of Environmental Engineering, Sources and Characterization	PCC	ENV	ENV	4	0	0	4	4	50	50	100	03
3	**20EV320**	Environmental Chemistry and applications	PCC	ENV	ENV	4	0	0	4	4	50	50	100	03
4	**20EV330**	Environmental Fluid Mechanics - I	PCC	ENV	ENV	4	0	0	4	4	50	50	100	03
5	**20EV340**	Survey Engineering	PCC	ENV	ENV/CIVIL	4	0	0	4	4	50	50	100	03
6	**20EV350**	Construction Engineering Materials	PCC	ENV	ENV/CTM	3	0	0	3	3	50	50	100	03
7	**20EV37L**	Water Quality Analysis Laboratory	PCC	ENV	ENV	0	0	3	3	1.5	50	50	100	03
8	**20EV38L**	Surveying practices for Environmental Engineering Applications	PCC	ENV	ENV	0	0	3	3	1.5	50	50	100	03
9	**20HU312**	Environmental Studies	HSMC	ENV	ENV	2	0	0	2	0	50	-	50	-
		Total								25	Total marks		850*	

Note: *For lateral entry students the total marks is 900

- **Environmental Studies course will be offered for the Programs with Physics Cycle of I Semester in 3rd Semester and in 4th semester in programs with Chemistry Cycle of I Semester.**
- **Universal Human Values course will be offered for the Programs with Chemistry Cycle of I Semester in third Semester and in 4th Semester of programs with Physics Cycle in I Semester.**
- **Credit calculation without UHV course: 4 credits x 4 subjects + 3 credits x 2 subjects+ 1.5 credits x 2 labs = 25.**
- **Credit calculation with UHV Course: 4 credits x 2 subjects + 3 credits x 4 subjects+ 2 Credits (HUV) +1.5 credits x 2 labs = 25.**
- **20MA311 will be offered for circuit programs and 20MA312 will be offered to non-circuit programs**
- *** Either 20HU311 or 20HU312 will be offered in 3rd Semester and hence the total marks are 850**

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SEMESTER: IV

SCHEME OF TEACHING AND EXAMINATION FOR B.E (ENVIRONMENTAL ENGINEERING)

Sl. No	Subject code	Course title	Category Code	Teaching department	QP Setting Dept.	Contact hours				CREDITS	Marks			SEE Duration in hrs.
						L	T	P	TOTAL		CIE	SEE	Total	
1	20MA411	Engineering Mathematics - IV	BSC	Mathematics	Maths	3	0	0	3	3	50	50	100	03
	20MATDIP410	Advanced Mathematics - II	BSC	Mathematics	Maths	3	0	0	3	0	00	50	50	03
2	20EV410	Environmental Fluid Mechanics-II	PCC	ENV	ENV	4	0	0	4	4	50	50	100	03
	20EV420	Water Resources Engineering and Management	PCC	ENV	ENV	4	0	0	4	4	50	50	100	03
3	20EV430	Environmental Microbiology and Ecology	PCC	ENV	ENV	3	0	0	3	3	50	50	100	03
4	20EV440	Geology and Geotechnical Engineering	PCC	ENV	ENV	3	0	0	3	3	50	50	100	03
5	20EV450	Disaster Management	PCC	ENV	ENV	3	0	0	3	3	50	50	100	03
6	20HU411	Universal Human Values(UHV)	HSMC	Offered by Parent department		2	0	0	2	2	25	25	50	1.5
7	20EV46L	Environmental Microbiology Laboratory	PCC	ENV	ENV	0	0	3	3	1.5	50	50	100	03
8	20EV47L	Environmental Fluid Mechanics Laboratory	PCC	ENV	ENV	0	0	3	3	1.5	50	50	100	03
		Total								25	Total marks		850*	

Note: For lateral entry students the total marks is 900

- **Environmental Studies course will be offered for the Programs with Physics Cycle (I Semester) in 3rd Semester and offered in programs with Chemistry Cycle (I Semester) in 4th Semester.**
- **Universal Human Values course will be offered for the Programs with Chemistry Cycle (I Semester) in third Semester and offered in programs with Physics Cycle (I Semester) in 4th Semester.**
- **Credit calculation without UHV course: 4 credits x 4 subjects + 3 credits x 2 subjects+ 1.5 credits x 2 labs = 25.**
- **Credit calculation with UHV Course: 4 credits x 2 subjects + 3 credits x 4 subjects+ 2 Credits (HUV) +1.5 credits x 2 labs = 25.**
- **20MA411 will be offered for circuit programs and 20MA412 will be offered to non-circuit programs**
- *** Either 20HU411 or 20HU412 will be offered in 3rd Semester and hence the total marks are 850**

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SCHEME OF TEACHING AND EXAMINATION FOR B.E (ENVIRONMENTAL ENGINEERING)

SEMESTER: V

Sl. No	Subject code	Course title	Category Code	Teaching department	QP Setting Dept.	Contact hours				CREDITS	Marks			SEE Duration in hrs.
						L	T	P	TOTAL		CIE	SEE	Total	
1	**20EV510**	Water Treatment and Supply Engineering	PCC	ENV	ENV	4	0	0	4	4	50	50	100	03
2	**20EV520**	Atmospheric Environmental Engineering	PCC	ENV	ENV	4	0	0	4	4	50	50	100	03
3	**20EV530**	Municipal and Bio-Medical Waste Management	PCC	ENV	ENV	3	2	0	5	4	50	50	100	03
4	**20EV540**	Remote Sensing and GIS in Environmental Engineering	PCC	ENV	ENV	3	2	0	5	4	50	50	100	03
5	**20EV55x**	Professional Elective-I	PEC	ENV	ENV	3	0	0	3	3	50	50	100	03
6	**20EV56x**	Open Elective-I	OEC	ENV		3	0	0	3	3	50	50	100	03
7	**20EV57L**	Water Treatment Process Laboratory	PCC	ENV	ENV	0	0	3	3	1.5	50	50	100	03
8	**20EV58L**	Atmospheric and Computer applications Laboratory	PCC	ENV	ENV	0	0	3	3	1.5	50	50	100	03
9	**20HU510**	Constitution of India / Essence of Indian Traditional Knowledge	HSMC	Humanities		2	0	0	2	0	50	-	50	-
		Total								25	Total marks		850	

Note:

- **Open elective is open to all the students excluding the students of parent program.**
- **Indian traditional knowledge course will be offered for the Programs with Chemistry Cycle (I Semester) in 5th Semester and offered in programs with Physics Cycle (I Semester) in 6th Semester.**
- **Constitution of India course will be offered for the Programs with Physics Cycle (I Semester) in 5th Semester and offered in programs with Chemistry Cycle (I Semester) in 6th Semester.**
- **Credit calculation: 4 credits x 4 subjects + 3 credits x 2 subjects + 1.5 credits x 2 labs = 25**

	Professional Elective-I
20EV551	Energy and Environment
20EV552	Computer applications in Environmental Engineering
20EV553	Life Cycle Analysis and Environmental Risk Assessment

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SCHEME OF TEACHING AND EXAMINATION FOR B.E (ENVIRONMENTAL ENGINEERING)

SEMESTER: VI

Sl. No	Subject code	Course title	Category Code	Teaching department	QP Setting Dept.	Contact Hours				Credits	Marks			SEE Duration in hrs.
						L	T	P	TOTAL		CIE	SEE	Total	
1	20EV610	Wastewater treatment Engineering	PCC	ENV	ENV	4	0	0	4	4	50	50	100	03
2	20EV620	Estimation and costing	PCC	ENV	ENV	3	2	0	5	4	50	50	100	03
3	20EV630	Environmental Impact Assessment	PCC	ENV	ENV	3	0	0	3	3	50	50	100	03
4	20EV64x	Professional Elective-II	PEC	ENV	ENV	3	0	0	3	3	50	50	100	03
5	20EV65x	Open Elective-II	OEC	Other Departments		3	0	0	3	3	50	50	100	03
6	20EV66x	Open Elective-III	OEC	Other Departments		3	0	0	3	3	50	50	100	03
7	20EV67L	Wastewater Treatment Process Laboratory	PCC	ENV	ENV	0	0	3	3	1.5	50	50	100	03
8	20EV68L	Design & Drawing of Environmental Systems	PCC	ENV	ENV	0	0	3	3	1.5	50	50	100	03
9	20EV69P	Mini Project	PWC	ENV		--	--	--	--	2	50	--	50	--
10	20HU611/ 20HU612	Essence of Indian Traditional Knowledge/ Constitution of India and Professional Ethics	HSMC	Humanities		2	0	0	0	--	50	--	50	--
		Total								25	Total marks		900	

Note:

- **Open elective is open to all the students excluding the students of parent program.**
- **Indian Traditional Knowledge course will be offered for the Programs with Chemistry Cycle (I Semester) in 4rd Semester and offered in programs with Physics Cycle (I Semester) in 6th Semester.**
- **Constitution of India course will be offered for the Programs with Physics Cycle (I Semester) in 5th Semester and offered in programs with Chemistry Cycle (I Semester) in 6th Semester.**
- **Team Size for Mini project can be between 1-4.**

Professional Elective-II	
20EV641	Hazardous Waste Technology and Management
20EV642	Environmental Systems Optimization
20EV643	Non-point sources pollution and management

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SEMESTER: VII

SCHEME OF TEACHING AND EXAMINATION FOR B.E (ENVIRONMENTAL ENGINEERING)

Sl. No	Subject code	Course title	Category Code	Teaching department	QP Setting Dept.	Contact Hours				Credits	Marks			SEE Duration in hrs.
						L	T	P	TOTAL		CIE	SEE	Total	
1	**20EV710**	Management Practices in Environmental Engineering	HSMC	ENV	ENV	4	0	0	4	4	50	50	100	03
2	**20EV72x**	Professional Elective-III	PEC	ENV	ENV	3	0	0	3	3	50	50	100	03
3	**20EV73x**	Professional Elective-IV	PEC	ENV	ENV	3	0	0	3	3	50	50	100	03
4	**20EV74x**	Open Elective-IV	OEC	Other Departments		3	0	0	3	3	50	50	100	03
5	**20EV75x**	Open Elective-V	OEC	Other Departments		3	0	0	3	3	50	50	100	03
6	**20EV76P**	Project Work Phase - 1	PWC	ENV		--	--	--	--	2	50	--	50	--
7	**20EV77P**	Industrial training /Internship	PWC	ENV		0	0	1	1	1	50	--	50	--
										19	Total marks		600	

Note:

- **Students can take SWAYAM courses from 3rd semester to 6th semester and qualification certificate is to be submitted to the department before the commencement of 7th semester for considering in Professional elective IV* offered in 7th Semester.**
- **HOD's shall be preparing list of subjects offered under SWAYAM and it should be minimum of 12 weeks (12weeks or 8+4 or 4+4+4 or any other combination).**
- **Students who could not qualify/ complete the SWAYAM course from 3rd to 6th semesters should register for professional elective-IV in 7th semester.**
- **Open elective is open to all the students excluding the students of parent program.**
- **Classes for 7th Semester preferred to be conducted only on Thursday to Saturday to encourage students to undergo internship in the Industry from Monday to Wednesday (Internship/Industrial Training).**
- **Students can take mini project or industrial training or internship (any one). A guide should be allotted to each student/ group at the department level to monitor the progress.**

Professional Elective-III		Professional elective-IV*	
20EV721	Operation and Maintenance of Environmental Facilities	**20EV731**	Application of Statistics in Environmental Engineering
20EV722	Occupational Safety and Health	**20EV732**	Industrial Wastewater Treatment Technologies
20EV723	Reactor Design Technology	**20EV733**	Environmental Economics, Legislation and Forensics

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(Effective from the academic year 2020-21)

SEMESTER: VIII

SCHEME OF TEACHING AND EXAMINATION FOR B.E (ENVIRONMENTAL ENGINEERING)

Sl. No	Subject code	Course title	Category Code	Teaching department	QP Setting Dept.	Contact Hours				Credits	Marks			SEE Duration in hrs.
						L	T	P	TOTAL		CIE	SEE	Total	
1	20EV81x	Professional Elective-V	PEC	ENV	ENV	3	0	0	3	3	50	50	100	03
2	20EV82x	Professional Elective-VI	PEC	ENV	ENV	3	0	0	3	3	50	50	100	03
3	20EV83P	Project work Phase - 2	PWC	ENV		--	--	--	--	10	70	30	100	03
		Total								16	Total marks		300	

	Professional Elective-V		Professional Elective-VI
20EV811	Natural Resources Conservation and Management	20EV821	Climate Change and Emission Trading
20EV812	Instrumentation and Automation in Environmental Engineering	20EV822	Transport and Fate of Environmental Pollutants
20EV813	Environmental Economics	20EV823	Environmental Forensics

Note: 1. The evaluation of the project work shall be done in four phases. 70 % weightage shall be given for the performance of the student in 1st (20 Marks), 2nd (20 Marks) and 3rd phases (30 Marks) evaluation (CIE) and 30 Marks for 4th phase evaluation (SEE).

2. Project Evaluation (Phase 1,2&3) should be done at the department Level Immediately after the 1st, 2nd and 3rd Theory test respectively.

3. Three-member committee will be formed (including the guide) at the department level to evaluate the project progress in phase 1, 2 & 3. This same committee will evaluate and finalize the CIE in all the phases. (Committee should remain same except for special cases).

4. Project team size can be 1-4.

5. Classes for 8th Semester preferred to be conducted only on Saturdays from 7.30AM to 1.30PM. Students should be allowed to work in the Industry from Monday to Friday (Internship), which may or may not be linked to the Project Work.

Category Code:

BSC – Basic Science Course
ESC – Engineering Science Course
PCC – Professional Core Course (Including Laboratory subjects)
PEC- Professional Elective Course
OEC- Open Elective Course
HSMC – Humanities Social Science and Management Course
PWC – Project Work Course

List of SWAYAM Courses identified by the department (for Professional Elective – IV):
(Students can complete 12 Weeks of SWAYAM course/s between 3-6th Semester to claim exemption for Elective - IV)

Sl No.	Course Name	Duration
1	GPS Surveying	4 weeks
2	Principles and Applications of Building Science	
3	Geotechnical Engineering Laboratory	
4	Organic Farming For Sustainable Agricultural Production	8 Weeks
5	Housing Policy & Planning	
6	Principles of Construction Management	
7	Project Planning & Control	
8	Plastic Waste Management	
9	Earth Sciences For Civil Engineering Part - I & II	
10	Basics of Health Promotion and Education Intervention	
11	Project Management	
12	Economics of Health And Health Care	
13	Ethics In Engineering Practice	
14	Knowledge Management	
15	Basic Environmental Engineering and Pollution Abatement	12 Weeks
16	Principles and Practices of Process Equipment and Plant Design	
17	Environmental Geomechanics	
18	Environmental Chemistry	
19	Integrated Waste Management For A Smart City	
20	Wastewater Treatment And Recycling	
21	Environmental Modeling and Simulation	
22	Availability and Management of Groundwater Resources	
23	Environmental & Resource Economics	

Sl No.	Course Name	Duration
24	Constitution of India and Environmental Governance: Administrative and Adjudicatory Process	
25	Advanced Contracts, Tendering and Public Procurement	
26	Industrial Safety Engineering	
27	Solar Energy Engineering and Technology	
28	Water Economics And Governance	

Note:

- ***The courses listed above are subject to availability in NPTEL / SWAYAM portal.***
- ***Students can take SWAYAM courses from 3rd semester to 6th semester and qualification certificate is to be submitted to the department before the commencement of 7th semester for considering in Professional elective IV* offered in 7th semester.***
- ***Students who could not qualify/ complete the SWAYAM course from 3rd to 6th semesters should register for Professional elective – IV in 7th semester.***
- ***SWAYAM course should be minimum of 12 weeks (12 weeks or 8 + 4 weeks or 4 + 4 + 4 week or any other combination).***

List of open electives offered by the Department of Environmental Engineering

Sl. No.	Semester :elective	Course Code	Course Title
1	5 : Open Elective – 1	20EV561	Waste to Energy Technologies.
2		20EV562	Disaster Management and Mitigation
3		20EV563	Built Environment
4	6 :Open Elective – 2	20EV651	Environmental Law
5		20EV652	Climate Change & Impact on Global Economy.
6		20EV653	Urban Environment & Sustainability.
7	6 :Open Elective – 3	20EV661	Environmental Hygiene and Sanitation
8		20EV662	Environmental Impact of infrastructure projects
9		20EV663	Waste management
10	7: Open Elective – 4	20EV741	Industrial Pollution and its Prevention
11		20EV742	Environmental Systems Management
12		20EV743	Environmental Health and Safety in industries
13	7: Open Elective - 5	20EV751	Environmental Social Governance
14		20EV752	Instrumentation and Automation for Environmental Applications
15		20EV753	Environmental Forensics