2018.2.20 <u>विश्वविद्यालय के आगामी शैक्षणिक सत्र 2018–19 हेतु विभिन्न विभागो द्वारा परास्नातक पाठ्यक्रमों में किये गये संशोधनों (परास्नातक पाठ्यक्रमों में कोई नया विषय आरम्भ किया जाना है, किसी विषय के **Credit Structure** में कोई संशोधन किया जाना है अथवा किसी विषय के पाठ्यक्रम में संशोधन) पर विचार एवं अनुमोदन।</u>

विश्वविद्यालय के आगामी शैक्षणिक सत्र 2018–19 हेतु विभिन्न विभागो द्वारा परास्नातक पाठ्यक्रमों में किये गये संशोधनों यथा नया विषय आरम्भ किया जाना, किसी विषय के Credit Structure में कोई संशोधन अथवा किसी विषय के पाठ्यक्रम में किये गये संशोधन विद्या परिषद के माननीय सदस्यों के अवलोकनार्थ पृष्ठ संख्या 349 से पृष्ठ संख्या 482 पर प्रस्तुत है:-

विभाग	पाठ्यक्रम	प्रभावी होने का सत्र
जनपदीय अभियंत्रण विभाग	एम0टेक0	2018-19
कम्प्यूटर साइंस एण्ड इंजी0	एम0टेक0	2018-19
	एम0सी0ए0	2018-19
विद्युत अभि0 विभाग	एम0टेक0	2018-19
विद्युतकण एवं संचार अभि0	एम0टेक0	2018-19
यांत्रिक अभियंत्रण	एम0टेक0	2018-19

विद्या परिषद के माननीय सदस्यों से अनुरोध है कि कृपया उक्त का अनुमोदन प्रदान करने की कृपा करें।

Minutes of the Board of Studies Meeting held on 19.05.2018 at 11.00 a.m. in the Chamber of Head, Civil Engineering Department

The following were present in the meeting:-

1. Prof. Govind Pandey — Head/Chairman
2. Er. Sanjay Yadav — IRS, Chief Public Relation Officer, (C.P.R.O., NER.)
3. Prof. S. M. Ali Jawaid — Professor
4. Dr. R. K. Shukla — Associate Professor
5. Dr. ShriRam — Associate Professor
6. Shri Ram Dular — Associate Professor
7. Shri S. N. Chaudhary — Associate Professor
8. Dr. A. K. Mishra — Associate Professor
9. Shri Vinay Kumar Singh — Assistant Professor
10. Dr. Sneha Gupta — Assistant Professor
11. Shri Madan Chandra Maurya — Assistant Professor
12. Ms. Shweta Yadav — Assistant Professor
13. Dr. Vinay Bhushan Chauhan — Assistant Professor
14. Dr. Pradeep Muley — Assistant Professor

Mrs. Sana Zafar, Asstt. Prof. , Shri Vikas Kumar, Asstt. Prof. and Shri Rohit Kumar, Asstt. Prof. were on leave.

The following decisions were taken:-

1. In view of the decision taken in the meeting of Dean, Postgraduate Studies, Research and Development held with all Heads of Department earlier, it was decided that a Programme Core (PC) from Semester-I be shifted to Semester-II and, in lieu thereof, a Common Course (CC) titled Ádvances in Civil Engineering' be introduced in all specializations of M. Tech. (Civil Engineering) Programme. Accordingly, one Programme Elective (PE) in Semester-II may be dropped. As such, three Programme Core (PC) and one Programme Elective (PE1) along with one Audit Course (AC) may be kept in Semester II. In Semester-III, two Programme Electives (PE2 and PE3) may be included along with Minor Project and Dissertation Part-I. The list of Programme Core (PC) of Semester-I to be shifted to Semester-II and the Programme Elective (PE) to be dropped from Semester II is mentioned in the Table given below:-

List of Programme Core (PC) Table to be shifted to II Semester and Programme Elective (PE) to be dropped from II Semester.

Sl. No.	M. Tech. (Civil Engineering) Programme	Programme Core to be shifted to II Semester	Programme Elective to be dropped from existing curriculum of Semester II
1.	Environmental Engineering	MCE-203: Wastewater Treatment	PE2
2.	Hill Area and Development Engineering	MCE-101: Ecology and Eco-development	PE2
3.	Structural Engineering	MCE-303: Prestressed Concrete	PE2
4.	Earthquake Engineering and Seismic Design	MCE-401: Seismology & Tectonics	PE2

2. The syllabus of Common Course (CC) titled Ádvances in Civil Engineering' was finalized.
3. The list of Programme Electives PE1, PE2 and PE3 was also finalized.

Contd....

350

4. The revised syllabus of B. Tech. (Civil Engineering) Programme considering the recommendations of Curriculum Development Workshop in accordance with Model Curriculum of A. I. C. T. E., New Delhi held on 03.02.2018 was finalized.

The meeting ended with the vote of thanks to the chair.

(Pradeep Muley)
Asstt. Prof.

(Vinay Bhushan Chauhan)
Asstt. Prof.
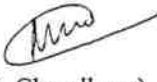
(Shweta Yadav)
Asstt. Prof.

(Madan Chandra Maurya)
Asstt. Prof.

(Sneha Gupta)
Asstt. Prof.

(Vinay Kumar Singh)
Asstt. Prof.

(A. K. Mishra)
Asso. Prof.

(S. N. Chaudhary)
Asso. Prof.

(Ram Dular)
Asso. Prof.

(ShriRam)
Asso. Prof.

(R. K. Shukla)
Asso. Prof.

(S. M. Ali Jawaid)
Professor

(Sanjay Yadav)
Chief Public Relation Officer,
N. E. R. Gorakhpur

(Govind Pandey)
Professor and Head
H.C.E.D.

No. MUT/Civil/Memo/2018
Copy forwarded for information and necessary action to:
1. Dean, Postgraduate Studies, Research and Development
2. Dean, Undergraduate Studies and Entrepreneurship.

Dated: 19.05.2018

(Govind Pandey)
Professor and Head
H.C.E.D.

CIVIL ENGINEERING DEPARTMENT
M. M. M. UNIVERSITY OF TECHNOLOGY
GORAKHPUR

Credit Structure for M. Tech. (Hill Area Development Engineering)
(For newly admitted students from Session 2014-2015)

Category Semesters	I	II	III	IV	Total
Maths (M)	4	-	-	-	4
Programme Core (PC)	13	13	-	-	26
Programme Electives (PE)	-	4	8	-	12
Minor Project (MP)	-	-	4	-	4
Dissertation (D)			4	14	18
Seminar (S)	-	-	-	2	2
Total	17	17	16	16	66

Curriculum for M. Tech. (Hill Area Development Engineering)
(For newly admitted students from Session 2014-2015)

Junior Year, Semester I

S. N.	Category	Paper Code	Subject Name	L	T	P	Credits
1.	M	MAS-112	Advanced Engineering Mathematics	3	1	0	4
2.	PC	MCE101A	Advances In civil Engineering	3	1	0	4
3.	PC	MCE-102	Water Resources Development	3	1	0	4
4.	PC	MCE-103	Hill Transportation	3	1	2	5
5.	AC		Audit Subject				-
			Total	12	4	2	17

Junior Year, Semester II

S. N.	Category	Paper Code	Subject Name	L	T	P	Credits
1.	PC	MCE-104	Land Resources Management	3	1	0	4
2.	PC	MCE-105	Hill Habitat, Water Supply and Sanitation	3	1	2	5
3.	PC	MCE-106	Ecology and Eco-development	3	1	0	4
4.	PE1	MCE-***	Programme Elective	3	1	0	4
5.	AC		Audit Subject				-
			Total	12	4	2	17

Senior Year, Semester III

S. N.	Category	Paper Code	Subject Name	L	T	P	Credits
1.	PE-2	***	Programme Elective-2	3	1	0	4
2.	PE-3	***	Programme Elective-3	3	1	0	4
3.	MP	MCE-120	Minor Project	0	0	8	4
4.	D	MCE-130	Dissertation Part-I	0	0	8	4
			Total	6	2	16	16

1

Senior Year, Semester IV

S. N.	Category	Paper Code	Subject Name	L	T	P	Credits
1.	S	MCE-140	Seminar	0	0	4	2
2.	D	MCE-150	Dissertation Part-II	0	0	28	14
			Total	0	0	32	16

Programme Core for M. Tech. (Hill Area Development Engineering)

S. No.	Paper Code	Subject Name	Prerequisite Subjects	L	T	P	Credits
1.			-	3	1	0	4
2.	MCE-102	Water Resources Development	-	3	1	0	4
3.	MCE-103	Hill Transportation	-	3	1	2	5
4.	MCE-104	Land Resources Development	-	3	1	0	4
5.	MCE-105	Hill Habitat, Water Supply and Sanitation	-	3	1	2	5
6.	MCE-120	Minor Project	-	0	0	8	4
7.	MCE-130	Dissertation Part-I	-	0	0	8	4
8.	MCE-140	Seminar	-	0	0	4	2
9.	MCE-150	Dissertation Part-II	Dissertation Part-I	0	0	28	14

Programme Electives (PEI)

S. N.	Paper Code	Subject Name	Prerequisite Subjects	L	T	P	Credits
1.	MCE-151	Environmental Quality Management	-	3	1	0	4
2.	MCE-152	Earth and Environment	-	3	1	0	4
3.	MCE-153	Principles of Remote Sensing	-	3	1	0	4
4.	MCE-154	Applied Geology		3	1	0	4
5.	MCE-157	Systems Analysis and Management		3	1	0	4

Programme Electives (PE2)

S. N.	Paper Code	Subject Name	Prerequisite Subjects	L	T	P	Credits
1.	MCE-156	Environmental Impact Assessment and Management	-	3	1	0	4
2.	MCE-162	Non-conventional Sources of Energy	-	3	1	0	4
3.	MCE-158	Solid Waste Management	-	3	1	0	4
4.	MCE-159	Groundwater Management	-	3	1	0	4
5.	MCE-167	Geographic Information System Techniques	-	3	1	0	4

Programme Electives (PE3)

S. No.	Paper Code	Subject	Prerequisite Subjects	L	T	P	Credits
1.	MCE-169	Disaster Management	-	3	1	0	4
2.	MCE-166	Water Pollution	-	3	1	0	4
3.	MCE-163	Earthquake Resistant Design of Buildings	-	3	1	0	4
4.	MCE-164	Geo-technique of Hill Area	-	3	1	0	4
5.	MCE-168	Water Retaining Structures	-	3	1	0	4

Courses for other Departments

S. No.	Paper Code	Subject	Prerequisite Subject	L	T	P	Credits
1.	MCE-191	Earth and Environment	-	3	1	2	5
2.	MCE-192	Environmental Impact Assessment and Management	-	3	1	0	4

Audit Courses for M. Tech. (Hill Area Development Engineering)

S. No.	Paper Code	Subject	Prerequisite Subject	L	T	P	Credits
1.	MAS-105	Applied Probability and Statistics	-	3	1	0	4
2.	MBA-109	Research Methodology	-	3	1	0	4
3.	MAS-109	Foreign Language-French	-	2	1	0	3
4.	MAS-110	Foreign Language-German	-	2	1	0	3
5.	BCS-68	Neural Network and Fuzzy System	-	3	1	0	4

Besides above electives, the students may be offered other electives subject to prior approval from competent authority

CIVIL ENGINEERING DEPARTMENT
M. M. M. UNIVERSITY OF TECHNOLOGY
GORAKHPUR

Credit Structure for M. Tech. (Environmental Engineering)
(For newly admitted students from Session 2014-2015)

Category Semesters	I	II	III	IV	Total
Maths (M)	4	-	-	-	4
Programme Core (PC)	13	13	-	-	26
Programme Electives (PE)	-	4	8	-	12
Minor Project (MP)	-	-	4	-	4
Dissertation (D)			4	14	18
Seminar (S)	-	-	-	2	2
Total	17	17	16	16	66

Curriculum for M. Tech. (Environmental Engineering)
(For newly admitted students from Session 2014-2015)

Junior Year, Semester I

S. N.	Category	Paper Code	Subject Name	L	T	P	Credits
1.	M	MAS-112	Advanced Engineering Mathematics	3	1	0	4
2.	PC	MCE-201	Environmental Chemistry and Microbiology	3	1	0	4
3.	PC	MCE-203 Wastewater Treatment	3	1	2	5
4.	PC	MCE-101 Advances in Civil Engineering	3	1	0	4
5.	AC		Audit Subject				-
			Total	12	4	2	17

Junior Year, Semester II

S. N.	Category	Paper Code	Subject Name	L	T	P	Credits
1.	PC	MCE-204	Air and Noise Pollution and Controls	3	1	2	5
2.	PC	MCE-205	Solid Waste Management	3	1	0	4
3.	PC		Water Treatment and Distribution	3	1	0	4
4.	PE2		Programme Elective	3	1	0	4
5.	AC		Audit Subject				-
			Total	12	4	2	17

Senior Year, Semester III

S. N.	Category	Paper Code	Subject Name	L	T	P	Credits
1.	PE2		Programme Elective-2	3	1	0	4
2.	PE3		Programme Elective-3	3	1	0	4
3.	MP	MCE-220	Minor Project	0	0	8	4
4.	D	MCE-230	Dissertation Part-I	0	0	8	4
			Total	6	2	16	16

21

Senior Year, Semester IV

S. N.	Category	Paper Code	Subject Name	L	T	P	Credits
1.	S	MCE-240	Seminar	0	0	4	2
2.	D	MCE-250	Dissertation Part-II	0	0	28	14
			Total	0	0	32	16

Programme Core for M. Tech. (Environmental Engineering)

S. N.	Paper Code	Subject	Prerequisite Subjects	L	T	P	Credits
1.	MCE-201	Environmental Chemistry and Microbiology	-	3	1	2	5
2.	MCE-202	Water Treatment and Distribution	-	3	1	0	4
4.	MCE-204	Air and Noise Pollution and Controls	-	3	1	2	5
5.	MCE-205	Solid Waste Management	-	3	1	0	4
6.	MCE-220	Minor Project	-	0	0	8	4
7.	MCE-230	Dissertation Part-I	-	0	0	8	4
8.	MCE-240	Seminar	-	0	0	4	2
9.	MCE-250	Dissertation Part-II	Dissertation Part-I	0	0	28	14

Programme Electives (PEI)

S. No.	Paper Code	Subject	Prerequisite Subjects	L	T	P	Credits
1.	MCE-151	Environmental Quality Management	-	3	1	2	5
2.	MCE-152	Earth and Environment	-	3	1	0	4
3.	MCE-153	Principles of Remote Sensing	-	3	1	2	4
4.	MCE-256	Environmental Sanitation and Ecology	-	3	1	2	4
5.	MCE-265	Plumbing Services	-	3	1	0	4

Programme Electives (PE2)

S. N.	Paper Code	Subject	Prerequisite Subjects	L	T	P	Credits
1.	MCE-156	Environmental Impact Assessment and Management	-	3	1	0	4
2.	MCE-167	Geographic Information System Techniques	-	3	1	0	4
3.	MCE-261	Ground Water Management	-	3	1	0	4
4.	MCE-259	Rural Environmental Technology	-	3	1	0	4
5.	MCE-262	Building Environmental and Services	-	3	1	0	4

Programme Electives (PE3)

S. N.	Paper Code	Subject	Prerequisite Subjects	L	T	P	Credits
1.	MCE-162	Non-conventional Sources of Energy	-	3	1	0	4
2.	MCE-268	Industrial Wastewater Treatment	-	3	1	0	4
3.	MCE-267	Hazardous Waste Management	-	3	1	0	4
4.	MCE-263	Geo-environmental Engineering	-	3	1	0	4
5.	MCE-169	Disaster Management	-	3	1	0	4

Audit Courses for M. Tech. (Environmental Engineering)

S. No.	Paper Code	Subject	Prerequisite Subject	L	T	P	Credits
1.	MAS-105	Applied Probability and Statistics	-	3	1	0	4
2.	MBA-109	Research Methodology	-	3	1	0	4
3.	MAS-109	Foreign Language-French	-	2	1	0	3
4.	MAS-110	Foreign Language-German	-	2	1	0	3
5.	BCS-68	Neural Network and Fuzzy System	-	3	1	0	4

Besides above electives, the students may be offered other elective subject is approval for competent authority

CIVIL ENGINEERING DEPARTMENT
M. M. M. UNIVERSITY OF TECHNOLOGY
GORAKHPUR

Credit Structure for M. Tech. (Structural Engineering)
(For newly admitted students from Session 2014-2015)

Category Semesters	I	II	III	IV	Total
Maths (M)	4	-	-	-	4
Programme Core (PC)	13	13	-	-	
Programme Electives (PE)	-	4	8	-	12
Minor Project (MP)	-	-	4	-	4
Dissertation (D)			4	14	18
Seminar (S)	-	-	-	2	2
Total	18	17	16	16	

Curriculum for M. Tech. (Structural Engineering)
(For newly admitted students from Session 2014-2015)

Junior Year, Semester I

S. N.	Category	Paper Code	Subject Name	L	T	P	Credits
1.	M	MAS-112	Advanced Engineering Mathematics	3	1	0	4
2.	PC	MCE-301	Advance Structural Analysis	3	1	2	4
3.	PC	MCE-302	Concrete Structures	3	1	2	5
4.	PC	MCE-101	Advances in Civil Engineering	3	1	0	4
5.	AC		Audit Subject				
			Total	12	4	2	18

Junior Year, Semester II

S. N.	Category	Paper Code	Subject Name	L	T	P	Credits
1.	PC	MCE-304	Analysis and Design of Dynamic Effects	3	1	2	5
2.	PC	MCE-305	Metal Structures	3	1	0	4
3.	PE1	.	Programme Elective-1	3	1	0	4
4.	PC	MCE-303	Prestressed Concrete	3	1	0	4
5.	AC		Audit Subject				-
			Total	12	4	2	17

Senior Year, Semester III

S. N.	Category	Paper Code	Subject Name	L	T	P	Credits
1.	PE2	.	Programme Elective-2	3	1	0	4
2.	PE3		Programme Elective-3	3	1	0	4
3.	MP	MCE-320	Minor Project	0	0	8	4
4.	D	MCE-330	Dissertation Part-I	0	0	8	4
			Total	6	2	16	16

Senior Year, Semester IV

S. N.	Category	Paper Code	Subject Name	L	T	P	Credits
1.	S	MCE-340	Seminar	0	0	4	2
2.	D	MCE-350	Dissertation Part-II	0	0	28	14
			Total	0	0	32	16

Programme Core for M. Tech. (Structural Engineering)

S. N.	Paper Code	Subject Name	Prerequisite Subjects	L	T	P	Credits
1.	MCE-301	Advance Structural Analysis	-	3	1	0	4
2.	MCE-302	Concrete Structures	-	3	1	2	5
3.	MCE-303	Prestressed Concrete	-	3	1	0	4
4.	MCE-304	Analysis and Design of Dynamic Effects	-	3	1	2	5
5.	MCE-305	Metal Structures	-	3	1	0	4
6.	MCE-320	Minor Project	-	0	0	8	4
7.	MCE-330	Dissertation Part-I	-	0	0	8	4
8.	MCE-340	Seminar	-	0	0	4	2
10.	MCE-350	Dissertation Part-II	Dissertation Part-I	0	0	28	14

Programme Electives (PEI)

S. N.	Paper Code	Subject Name	Prerequisite Subjects	L	T	P	Credits
1.	MCE-351	Maintenance and Rehabilitation of Structures	-	3	1	0	4
	MCE-368	Bridge Engineering		3	1	0	4
3.	MCE-352	Pre-cast and Composite Structures	-	3	1	0	4
4.	MCE-353	Rock Engineering	-	3	1	0	4
5.	MCE-354	Continuum Mechanics	-	3	1	0	4

Programme Electives (PE2)

S. N.	Paper Code	Subject Name	Prerequisite Subjects	L	T	P	Credits
1.	MCE-356	Retrofitting of Buildings	-	3	1	0	4
2.	MCE-357	Hydraulic Structures	-	3	1	0	4
3.	MCE-358	Machine Foundations	-	3	1	0	4
	MCE-369	Ground Improvement Technique		3	1	0	4
5.	MCE-359	Finite Element Method	-	3	1	0	4

Programme Electives (PE3)

S. N.	Paper Code	Subject Name	Prerequisite Subjects	L	T	P	Credits
1.	MCE-361	Nonlinear Analysis of Structures	.	3	1	0	4
2.	MCE-366	Design of Plates and Shells	.	3	1	0	4
3.	MCE-362	Earth & Rock fill Dam.	.	3	1	0	4
4.	MCE-363	Project Planning and Control	.	3	1	0	4
5.	MCE-367	Industrial Structures		3	1	0	4
6.	MCE-364	Soil Structure interaction		3	1	0	4

Audit Courses for M. Tech. (Structural Engineering)

S. No.	Paper Code	Subject	Prerequisite Subject	L	T	P	Credits
1.	MAS-105	Applied Probability and Statistics	-	3	1	0	4
2.	MBA-109	Research Methodology	-	3	1	0	4
3.	MAS-109	Foreign Language-French	-	2	1	0	3
4.	MAS-110	Foreign Language-German	-	2	1	0	3
5.	BCS-68	Neural Network and Fuzzy System	-	3	1	0	4

Besides above electives the students may be offered other electives subject to approval from competent authority

CIVIL ENGINEERING DEPARTMENT
M. M. M. UNIVERSITY OF TECHNOLOGY
GORAKHPUR

Credit Structure for M. Tech. (Earthquake Engineering and Seismic Design)
(For newly admitted students from Session 2014-2015)

Category Semesters	I	II	III	IV	Total
Maths (M)	4	-	-	-	4
Programme Core (PC)	13	13	-	-	26
Programme Electives (PE)	-	4	8	-	12
Minor Project (MP)	-	-	4	-	4
Dissertation (D)			4	14	18
Seminar (S)	-	-	-	2	2
Total	17	17	16	16	66

Curriculum for M. Tech. (Earthquake Engineering and Seismic Design)

Junior Year, Semester I

S. N.	Category	Paper Code	Subject Name	L	T	P	Credits
1.	M	MAS-112	Advanced Engineering Mathematics	3	1	0	4
2.	PC	MCE-301	Advance Structural Analysis	3	1	0	4
3.	PC	MCE-101	Advances in Civil Engineering	3	1	0	4
4.	PC	MCE-402	Geotechnical Earthquake Engineering	3	1	2	5
5.	AC		Audit Subject				-
			Total	12	4	2	17

Junior Year, Semester II

S. N.	Category	Paper Code	Subject Name	L	T	P	Credits
1.	PC	MCE-403	Structural Dynamics	3	1	2	5
2.	PC	MCE-404	Earthquake Resistant Design of structures	3	1	0	4
3.	PE1		Programme Elective-1	3	1	0	4
4.	PC	MCE-401	Seismology and Techtonics	3	1	0	4
5.	AC		Audit Subject				-
			Total	12	4	2	17

Senior Year, Semester III

S. N.	Category	Paper Code	Subject Name	L	T	P	Credits
1.	PE2		Programme Elective-2	3	1	0	4
2.	PE3		Programme Elective-3	3	1	0	4
3.	MP	MCE-420	Minor Project	0	0	8	4
4.	D	MCE-430	Dissertation Part-I	0	0	8	4
			Total	6	2	16	16

Senior Year, Semester IV

S. N.	Category	Paper Code	Subject Name	L	T	P	Credits
1.	S	MCE-440	Seminar	0	0	4	2
2.	D	MCE-450	Dissertation Part-II	0	0	28	14
			Total	0	0	32	16

Programme Core for M. Tech. (Earthquake Engineering and Seismic Design)

S.N.	Paper Code	Subject Name	Prerequisite Subjects	L	T	P	Credits
1.	MCE-301	Advanced Structural Analysis	-	3	1	2	5
2.	MCE-401	Seismology & Tectonics	-	3	1	0	4
3.	MCE-402	Geotechnical Earthquake Engineering	-	3	1	2	5
4.	MCE-403	Structural Dynamics	-	3	1	2	5
5.	MCE-404	Earthquake Resistant Design of structures	-	3	1	0	4
6.	MCE-420	Minor Project	-	0	0	8	4
7.	MCE-430	Dissertation Part-I	-	0	0	8	4
8.	MCE-440	Seminar	-	0	0	4	2
10.	MCE-450	Dissertation Part-II	Dissertation Part-I	0	0	28	16

Programme Electives (PE1)

S.N.	Paper Code	Subject Name	Prerequisite Subjects	L	T	P	Credits
1.	MCE-351	Maintenance and Rehabilitation of Structures	-	3	1	0	4
2.	MCE-352	Pre-cast and Composite Structures	-	3	1	0	4
3.	MCE-353	Rock Engineering	-	3	1	0	4
	MCE-368	Bridge Engineering	—	3	1	0	4
5.	MCE-354	Continuum Mechanics	-	3	1	0	4

Programme Electives (PE2)

S.N.	Paper Code	Subject Name	Prerequisite Subjects	L	T	P	Credits
1.	MCE-356	Retrofitting of Buildings	-	3	1	0	4
2.	MCE-357	Hydraulic Structures	-	3	1	0	4
3.	MCE-358	Machine Foundations	-	3	1	0	4
	MCE-369	Ground Improvement Techniques		3	1	0	4
5.	MCE-359	Finite Element Method	-	3	1	0	4

Programme Electives (PE3)

S.N.	Paper Code	Subject Name	Prerequisite Subjects	L	T	P	Credits
~~1.~~	~~MCE-361~~	~~Nonlinear Analysis of Structures~~	-	3	1	0	4
~~2.~~	~~MCE-363~~	~~Project Planning and Control~~	-	3	1	0	4
3.	MCE-364	Soil Structure Interaction	-	3	1	0	4
	MCE-367	Industrial Structure		3	1	0	4
	MCE-366	Design of Plates and Shells		3	1	0	4
6.	MCE-461	Random Vibrations	-	3	1	0	4

Audit Courses for M. Tech. (Earthquake Engineering and Seismic Design)

S. No.	Paper Code	Subject	Prerequisite Subject	L	T	P	Credits
1.	MAS-105	Applied Probability and Statistics	-	3	1	0	4
2.	MBA-109	Research Methodology	-	3	1	0	4
3.	MAS-109	Foreign Language-French	-	2	1	0	3
4.	MAS-110	Foreign Language-German	-	2	1	0	3
5.	BCS-68	Neural Network and Fuzzy System	-	3	1	0	4

Besides above electives, the students may be offered other electives subject to approval for competent authority.

2017.3.13 <u>शैक्षिक सत्र 2017–18 के आड सेमेस्टर के समस्त **M.Tech., MCA** एवं **MBA** के पाठ्यक्रमों हेतु बोर्ड आफ स्टडीज द्वारा अनुमोदित परीक्षकों की सूची का अवलोकन एवं एवं विभिन्न स्नातक/परास्नातक पाठ्यक्रमों के सैलेबस में आंशिक संशोधन सहित सत्र 2017–18 के आड सेमेस्टर से प्रभावी किये जाने का अनुमोदन।</u>

शैक्षिक सत्र 2017–18 के आड सेमेस्टर के समस्त M.Tech., MCA एवं MBA पाठ्यक्रमों हेतु विभागीय बोर्ड आफ स्टडीज द्वारा संस्तुत लिखित एवं प्रायोगिक परीक्षा का पैनल प्राप्त किया गया, जिसे मा0 कुलपति महोदय के अनुमोदनोपरान्त परीक्षा नियंत्रक को अग्रिम कार्यवाही हेतु प्रेषित किया गया।

निम्न विभागो द्वारा पाठ्यक्रमों में किये गये संशोधन पृष्ठ संख्या 142 से पृष्ठ संख्या 150 पर संलग्न है। पाठ्यक्रमों का विवरण निम्नवत् है:-

विभाग	विषय कोड	विषय का नाम	प्रभावी होने का सत्र
प्रयुक्त विज्ञान विभाग	MAS-101 A	Numerical Methods and Engineering Optimization	2018-19
	MAS-112 A	Advanced Engineering Mathematics	2018-19
	MAS-113 A	Probabilistic Modelling	2017-18
विद्युतकण एवं संचार अभि0 विभाग	MEC - 167	Organic Electronics Devices and Circuits	2018-19

विद्या परिषद के माननीय सदस्यों से अनुरोध है कि कृपया उक्त का अनुमोदन प्रदान करने की कृपा करें।

DEPARTMENT OF APPLIED SCIENCES
MADAN MOHAN MALAVIYA UNIVERSITY OF TECHNOLOGY
GORAKHPUR

Minutes of Board of Studies of Department of Applied Sciences M.M.M. University of Technology, Gorakhpur held on Dated: 23.09.2017

The Following were present:-

1.	Dr. B. K. Pandey	Chairman	
2.	Prof. D. K. Dwivedi	Member Internal	
3.	Dr. D. Kandu	Member Internal	
4.	Dr. P.P. Pande	Member Internal	
5.	Dr. S.P. Singh	Member Internal	
6.	Dr. A.K Barnwal	Member Internal	
7.	Dr Harish chandra	Member Internal	
8.	Sri Ravi Kumar Gupta	Member Internal	
9.	Dr. Krishna Kumar	Member Internal	
10.	Dr. Abhijit Mishra	Member Internal	
11.	Dr. Abhishek Kr. Gupta	Member Internal	
12.	Dr. Ram Keval	Member Internal	
13.	Prof Sanjay Chaubey	Member External	
14.	Prof G. Anantharaman	Member External	

The Following decisions were taken

1. The list of Examiners for Theory & Practical Examination of Mathematics & Humanities for ODD Semester 2017-18 session was prepared.
2. The revised syllabus of Advanced Engineering Mathematics (MAS-112) has been recommended, which will be effective from the session 2018-19.
3. The revised syllabus of Numerical Method & Engineering Optimization (MAS-101) has been recommended, which will be effective from the session 2018-19.
4. The revised syllabus of Probabilistic Modeling (MAS-113) has been recommended, which will be effective from the session 2017-18 (Even Semester).

The meeting ended with thanks to the chairman

HASD

No. MUT/Appl. Sc./   /2017   Date: 23Sept   . 2017

Copy for information & necessary action to:-

1. Dean PGS. R&D

HASD

4

MAS 101	Numerical Methods and Engineering Optimization

Course category	:	Basic Sciences & Maths (BSM)
Pre-requisites	:	NIL
Contact hours/week	:	Lecture: 3, Tutorial: 1 , Practical: 2
Number of Credits	:	5
Course Assessment methods	:	Continuous assessment through tutorials, assignments, quizzes, Minor and Major Theory & Practical Examination
Course Outcomes	:	The students are expected to be able to demonstrate the following knowledge, skills and attitudes after completing this course

1. To find the root of a curve using iterative methods
2. To interpolate a curve using Gauss, Newton's interpolation formula.
3. Use the theory of optimization methods and algorithms developed for various types of optimization problems.
4. To apply the mathematical results and numerical techniques of optimization theory to Engineering problems.

Topics Covered

UNIT-I

Numerical Methods I: Solution of algebraic and transcendental equations by Bisection, Regula-Falsi and Newton-Raphson methods. Interpolation: Newton's forward and backward interpolation formulae, Lagrange's formula and Newton's divided difference formula.	9

UNIT-II

Numerical Methods II: Solution of system of linear equations by Gauss Jacobi method, Guass-Siedel method, Relaxation method and LU decomposition method, Cholesky method. Numerical differentiation, Numerical Integration: Trapezoidal Rule, Simpson's one-third and three-eight rules.	9

UNIT-III

Classical Optimization Techniques: Introduction, Review of single and multi-variable optimization methods with and without constraints, Non-linear one-dimensional minimization problems, Examples.	9

UNIT-IV

Constrained Optimization Techniques: Introduction, Direct Methods, Cutting plane method, Indirect methods, Convex programming problems, Exterior penalty function method, Examples and	9

problems. Unconstrained optimization techniques: Introduction, Descent methods, Steepest Descent methods Newton's method, Quasi-Newton's method.

Experiments:

1. To implement Regula Falsi method to solve algebraic equations.
2. To implement numerical integration to solve algebraic equations.
3. To implement Gauss-Siedel method for solution of simultaneous equations.
4. To implement Runge-Kutta method of order four to solve differential equations.
5. To implement Euler's method to find solution of differential equations.
6. To find optimum solution to problem parameters.
7. To find derivatives of static displacements and stresses.
8. To write Computer based algorithm and program for solution of Eigen-value problems.
9. Reduction of size of an optimization problem using Reduced basis technique.
10. To find Derivatives of Eigen-values and Eigen vectors.

Textbooks

1.	Engineering Optimization: S.S.Rao; New Age International.
2.	Applied Optimal Design: E.J. Haug and J.S. Arora; Wiley New York.
3.	P. Kandasamy, K. Thilagavathy &| K. Gunavathy, Numerical Methods, Schand Publishers.

MAS 112	Advanced Engineering Mathematics

Course category	:	Basic Sciences & Maths (BSM)
Pre-requisites	:	NIL
Contact hours/week	:	Lecture: 3, Tutorial: 1, Practical: 0
Number of Credits	:	3
Course Assessment methods	:	Continuous assessment through tutorials, assignments, quizzes, Minor and Major Theory Examination.
Course Outcomes	:	The students are expected to be able to demonstrate the following knowledge, skills, and attitudes after completing this course

1. to find out the dimension of vector spaces
2. describe the differences between finite-difference and finite-element methods for solving PDEs;
3. solve Elliptical (Laplace/Poisson) PDEs using finite differences;
4. solve functional using Euler method.

Topics Covered

UNIT-I	
Vector spaces and Linear transformation: Vector spaces, subspaces, Linear dependence, Basis and Dimension, Linear transformations, Kernel & images, matrix representation of linear transformation, change of basis, Eigen values and Eigen vectors of linear operators, diagonalization.	9

UNIT-II	
Numerical Techniques: Solution of algebraic and transcendental equations using bisection, Regula Falsi and Newton Raphson's method, Numerical solution to linear system, LU factoring decomposition, Cholesky method, Gauss Seidal method, Numerical eigen value problem, Jacobi, Givens method	9

UNIT-III	
Calculus of Variation: Functionals, Euler's equation and its generalization. One and several independent variables. Initial value problems. Weierstrass's sufficiency condition for weak and strong minima and maxima	9

UNIT-IV	
Numerical Solution of Partial Differential Equations: Classification of partial differential equations of the second order. Laplace equations and its solution by Liebmann's process. Poisson equation. Solution of Parabolic, Eliptic and Hyperbolic Equations. Applications to Engineering.	9

	Textbooks
1.	K. Hoffman, R Kunze, Linear Algebra, Prentice Hall of India, 1971.
2.	I. M. Gelfrand, S. V. Fomin, Calculus of Variation, Dover Publications.
3.	M. D. Raisinghania, Advanced Differential Equations, Schand Publishers.

MAS 113	Probabilistic Modelling

Course category	:	Basic Sciences & Maths (BSM)
Pre-requisites	:	NIL
Contact hours/week	:	Lecture: 3, Tutorial: 1 , Practical: 2
Number of Credits	:	5
Course Assessment methods	:	Continuous assessment through tutorials, assignments, quizzes and Minor and Major Theory & Practical Examination
Course Outcomes	:	The students are expected to be able to demonstrate the following knowledge, skills, and attitudes after completing this course

1. define, illustrate, and apply the concepts of probability;
2. analyze and interpret statistical data using appropriate probability distributions
3. define, illustrate, and apply the concepts of discrete and continuous random variables
4. understand the concept of Queuing models and apply appropriate queuing model, mainly M/M/1 model.

Topics Covered

UNIT-I

Probability and Probability distributions: Definition, sample space, conditional probability, Baye's theorem, Bernouli's trials, Brief Introduction of Binomial, Poisson and Normal distributions with their applications.	9

UNIT-II

Random Variables: Random Variables, Distribution and Density functions, Moment and Moment generating functions, Independent Random Variables, Marginal and Conditional Distributions, Conditional Expectation.	9

UNIT-III

Queuing Theory: Single and Multiple server Markovian queueing models - customer impatience - Priority queues - M/M/1 queueing system - queueing theory applications.	9

UNIT-IV

Statistical Hypothesis: Concept of Statistical Hypothesis, hypothesis, Procedure of testing the hypothesis, Types of Error, Level of Significance, Degree of freedom. Chi-Square Test, Properties, and Constants of Chi-Square Distribution. Student's t-Distribution, Properties & Applications of t-Distribution. Analysis of Variance, F-Test, Properties & Applications of F-Test.	9

COMPUTER PROGRAMMING LAB

Implement a C programme to calculate Probability, Means, Moments, Variance, Skewness, Standard Deviation, Coefficient of Variation. C program to generate random numbers, to implement various queue operations.

Textbooks

1.	V. Rohatgi., An Introduction to probability and Mathematical Statistics, Wiley Eastern Ltd. New Delhi.
2.	J.K. Sharma, Operation Research, Laxmi Publications.
3.	K. Swaroop, P. K. Gupta, Man Mohan, Operation Research, Sultan chand Publishers.