1.2.2
Percentage of Programmes in which Choice Based Credit System (CBCS)/elective course system has been implemented (Data for the latest completed academic year)

Additional Information: Change document from R13 to A1 & A1 to A2

S.No	Description	Page No
1	Change document from R13 to A1-All Depts.	01 to 64
2	Change document from A1 to A2-All Depts.	65 to 130

Change document from R13 to A1
All Programmes

B.Tech(Civil)

DEPARTMENT OF CIVIL ENGINEERING

MVGR College of Engineering (Autonomous)

Accredited by NBA, NAAC with 'A' Grade of UGC, Approved by AICTE, New Delhi
Permanently Affiliated to JNTU, Kakinada, Listed U/S 2(f) & 12(B) of the UGC Act 1956
Vijayaram Nagar Campus, Chintalavalasa, Vizianagaram-535 005

Change document for Civil Engineering Curriculum

from JNTUK R13 Regulation to A1 Regulation

BTech Civil Engineering

1st Year 1st Semester					
JNTUK R13 Regulation			**A1 Regulation**		
S. No.	**Subject**	**Credits**	**S. No.**	**Subject**	**Credits**
1	English – I	3	1	Engineering Mathematics – I	3
2	Mathematics - I	3	2	Engineering Physics	3
3	Engineering Chemistry	3	3	Computer Programming	3
4	Engineering Mechanics	3	4	Engineering Drawing	3
5	Environmental Studies	3	5	Environmental Studies	3
6	Computer Programming	3	6	English Language Practice – I	2
7	Engineering Chemistry Laboratory	2	7	Engineering Physics Laboratory	2
8	English – Communication Skills Lab - I	2	8	Computer Programming Laboratory	2
9	C Programming Lab	2		-	
Total Credits		**24**	**Total Credits**		**21**

1st Year 2nd Semester					
JNTUK R13 Regulation			A1 Regulation		
S. No.	Subject	Credits	S. No.	Subject	Credits
1	English - II	3	1	Mathematical Methods	3
2	Mathematics - II	3	2	Engineering Chemistry	3
3	Basic Electrical and Electronics Engineering	3	3	Basic Electrical and Electronics Engineering	3
4	Engineering Physics	3	4	Applied Mechanics	3
5	Ethical & Moral Sciences	3	5	Foundation Elective I	3
6	Engineering Drawing	3	6	English Language Practice – II	2
7	English-Communication Skills Lab - II	2	7	Engineering Chemistry Laboratory	2
8	Engineering Physics Laboratory	2	8	Basic Engineering Workshop	2
9	Engineering Workshop & IT Workshop	2		-	
Total Credits		**24**	**Total Credits**		**21**

2nd Year 1st Semester					
JNTUK R13 Regulation			A1 Regulation		
S. No.	Subject	Credits	S. No.	Subject	Credits
1	Electrical and Electronics Engineering	3	1	Strength of Materials-I	4
2	Probability and Statistics	3	2	Elements of Surveying	4
3	Strength of Materials-I	3	3	Fluid Mechanics	4
4	Building Materials and Construction	3	4	Building Materials and Concrete Technology	4
5	Surveying	3	5	Managerial Economics & Financial Analysis	3
6	Fluid Mechanics	3	6	Foundation Elective II	3
7	Surveying Field work-I	2	7	Surveying Laboratory	2
8	Strength of Materials Lab	2	8	Fluid Mechanics Laboratory	2
	-		9	Audit Course 1	
	Total Credits	**22**		**Total Credits**	**26**

2nd Year 2nd Semester					
JNTUK R13 Regulation			A1 Regulation		
S. No.	Subject	Credits	S. No.	Subject	Credits
1	Building Planning & Drawing	3	1	Strength of Materials-II	4
2	Managerial Economics and Financial Analysis	3	2	Hydraulics and Hydraulic Machinery	4
3	Strength of Materials- II	3	3	Structural Analysis	4
4	Hydraulics and Hydraulic Machinery	3	4	Building Planning & Civil Engineering Drawing	4
5	Concrete Technology	3	5	Core Elective I	3
6	Structural Analysis - I	3	6	Strength of Materials Laboratory	2
7	Fluid Mechanics and Hydraulic Machinery Lab	2	7	Hydraulic Machinery Laboratory	2
8	Concrete Technology Lab	2	8	Audit Course 2	
9	Surveying Field work- II	2		-	
Total Credits		**24**	**Total Credits**		**23**

3rd Year 1st Semester					
JNTUK R13 Regulation			A1 Regulation		
S. No.	Subject	Credits	S. No.	Subject	Credits
1	Engineering Geology	3	1	Water Resources Engineering	4
2	Structural Analysis - II	3	2	Design of Reinforced Concrete Structures	4
3	Design and Drawing of Reinforced Concrete Structures	3	3	Transportation Engineering	4
4	Geotechnical Engineering - I	3	4	Geotechnical Engineering	4
5	Transportation Engineering-I	3	5	Environmental Engineering I	4
6	IPR & Patents	2	6	Open Elective I	3
7	Geotechnical Engineering Lab	2	7	Concrete Technology Laboratory	2
8	Engineering Geology Lab	2	8	Engineering Geology Laboratory	2
	-		9	Audit Course 3	
	Total Credits	**21**		**Total Credits**	**27**

3rd Year 2nd Semester					
JNTUK R13 Regulation			**A1 Regulation**		
S. No.	**Subject**	**Credits**	**S. No.**	**Subject**	**Credits**
1	Design and Drawing of Steel Structures	3	1	Design of Steel Structures	4
2	Geotechnical Engineering – II	3	2	Advanced Reinforced Concrete Structures	4
3	Water Resources Engineering–I	3	3	Foundation Engineering	4
4	Environmental Engineering - I	3	4	Environmental Engineering II	4
5	Transportation Engineering – II	3	5	Core Elective II	3
6	Open Elective	3	6	Open Elective II	3
7	Computer Aided Engineering Drawing	2	7	Transportation Engineering Laboratory	2
8	Transportation Engineering Lab	2	8	Geotechnical Engineering Laboratory	2
9	-		9	Audit Course 4	
			10	Audit Course 5	
Total Credits		**22**	**Total Credits**		**26**

4th Year 1st Semester					
JNTUK R13 Regulation			A1 Regulation		
S. No.	Subject	Credits	S. No.	Subject	Credits
1	Environmental Engineering-II	3	1	Estimation and Contracts	4
2	Prestressed Concrete	3	2	Core Elective III	3
3	Construction Technology and Management	3	3	Core Elective IV	3
4	Water Resources Engineering-II	3	4	Core Elective V	3
5	Remote Sensing and GIS Applications	3	5	Core Elective VI	3
6	Elective - I	3	6	Core Elective VII	3
7	Environmental Engineering Lab	2	7	Core Elective VIII (Self-study)	3
8	GIS & CAD Lab	2	8	GIS and CAD Lab	2
	-		9	Environmental Engineering Laboratory	2
Total Credits		**22**	**Total Credits**		**26**

4th Year 2nd Semester					
JNTUK R13 Regulation			A1 Regulation		
S. No.	Subject	Credits	S. No.	Subject	Credits
1	Estimating, Specifications and Contracts	3	1	Directed Study and Project Work	10
2	Elective-II	3	2	Audit Course-6	
3	Elective-III	3		-	
4	Elective-IV	3		-	
5	Project Work	9		-	
Total Credits		**21**	**Total Credits**		**10**

Changes in A1 Regulation curriculum in comparison with R13 Regulation

- In A1 Regulation, the total number of credits from 1st Semester to 2nd Semester is 42 compared to 48 in R13 Regulation. The number of credits from 3rd Semester to 4th Semester is 49 compared to 42 in R13 Regulation. From 5th to 6th Semester, the total number of credits is 53 in A1 Regulation compared to 43 in R13 Regulation. In the final year, the total number of credits are 36 compared to 43 in R13 Regulation.
- The total number of credits in A1 Regulation is set at 180 similar to R13 Regulation.
- The number of credits for Core Mandatory subjects is increased to 4 compared to 3 credits in R13 Regulation whereas the credits Core Elective subjects is 3 similar to R13 Regulation.
- All laboratory courses are 2 credit courses similar to R13 Regulation.
- In A1 Regulation, 2 open electives are offered compared to only 1 open elective for 3 credits.
- A total of 8 Core Electives are offered in A1 Regulation compared to only 4 Core Electives in R13 Regulation.
- One self-study course is offered the 7th Semester of A1 Regulation where students can choose from a set of 3 courses that are offered by the Department or can choose a MOOCs course and submit a completion certificate. The MOOCs course chosen by the student shouldn't have been offered by the Department in the curriculum before or during the current semester.
- An additional laboratory course "Hydraulic Machinery Laboratory" is introduced in the 4th Semester of A2 Regulation for 2 credits.
- Engineering Geology course is moved into Core Elective-I in A1 Regulation.
- In A1 Regulation, the entire 8th Semester is earmarked for Project Work to encourage students to spend more time on quality projects. Along with project work, directed study is introduced in A1 Regulation where students learn the basics of Research Methodology and submit an assignment on questions related to the literature review of the project work.
- A total of 6 Audit Courses are embedded into A1 Regulation covering a wide variety of courses such as Professional Ethics and IPR, General Aptitude,

Communication Skills, Professional and Business Communication, Entrepreneurship Development, etc., to improve student's aptitude and holistic learning.

- The number of Core Elective Courses offered in A1 Regulation are 24 similar to R13 Regulation.
- In addition to Core Elective Courses, the Department has introduced 6 Open Elective Courses that can offered to other Departments.
- In A1 Regulation, Prestressed Concrete is added with Footings and Staircase design and offered as "Advanced Reinforced Concrete Structures".
- In A1 Regulation, Water Resources Engineering is renamed as "Advanced Water Resources Engineering" and Transportation Engineering-II is renamed as Railways, Harbours and Airports. Both these courses are offered in Core Elective-3.
- Remote Sensing and GIS Applications is renamed as "Remote Sensing and GIS and is offered in Core Elective-7.
- Internal marks in A1 Regulation are increased to 40 compared to 30 in R13 Regulation. End semester exams are conducted for 60 marks compared to 70 marks in R13 Regulation. Students shall be assessed for Assignments for a total of 10 marks instead of Quiz Exams in R13 Regulation.

B.Tech(EEE)

Course details under JNTUK (R13) Regulation		Percentage of Syllabus content added or replaced	Course details under Autonomous (A1) Regulation	
Course code	**Name of the Course**		**Course code**	**Name of the Course**
R13101	English - I	Removed	---	---
R13107	Mathematics - II (Mathematical Methods)	10% replaced	A1MAT002	Mathematical Methods
R13108	Professional Ethics and Human Values	30% replaced	A1ACA509	Professional Ethics & IPR
R13111	English Communication Skills Lab - I	30% replaced	A1EHL001	English Language Practice - I
R13103	Engineering Physics	20% replaced	A1PYT002	Applied Physics
R13112	Engineering Physics Laboratory	40% replaced	A1PYT002	Applied Physics Lab
R13113	Engineering Physics - Virtual Labs - Assignments	Removed	---	---
R13114	Engineering Workshop & IT Workshop	40% replaced	A1MEW001	Basic Engineering Workshop
R13201	English - II	Removed	---	---
R13202	Mathematics - III	10% replaced	A1MAT104	Engineering Mathematics - II
R13110	Engineering Mechanics	Removed	---	---
RT21022	Thermal and Hydro Prime movers	Removed	---	---
R13115	Engineering Chemistry Lab	20% replaced	A1CYL001	Engineering Chemistry Lab
R13211	English Communication Skills Lab - II	30% replaced	A1EHL002	English Language Practice - II
R13116	C Programming lab	10% added	A1CIL001	Computer Programming Lab
RT22023	Pulse & Digital Circuits	20% replaced	A1EET206	Electronics Devices & Circuits - 2
RT21024	Complex Variables and Statistical Methods	15% replaced	A1MAT110	Complex Variables & Statistical Methods
RT21026	Electrical Machines - I	50% replaced	A1EET205	Electrical Machines - 1
RT21027	Thermal and Hydro Lab	Removed	---	---
RT22022	Switching Theory and Logic Design	5% replaced	A1EET209	Digital Electronics
RT22024	Power Systems - I	50% replaced	A1EET208	Power Generation & Control
RT22025	Electrical Machines - II	50% replaced	A1EET207	Electrical Machines - 2
RT22026	Control Systems	10% replaced	A1EET210	Control Systems
RT22027	Electrical Machines-I Lab	35% replaced	A1EEL202	Electrical Machines Lab - 1
RT22028	Electronic Devices & Circuits Lab	10% replaced	A1EEL203	Electronic Devices & Circuits Lab
RT31022	Managerial Economics and Financial Analysis	10% replaced	A1MST001	Managerial Economics & Financial

				Analysis
RT31021	Electrical Measurements	35% replaced	A1EET214	Electrical Measurements & Instrumentation
RT31023	Power Systems - II	50% replaced	A1EET213	Power Transmission and Distribution
RT31024	Electrical Machines – III	Removed	---	---
RT31025	Power Electronics	10% replaced	A1EET212	Power Electronics
RT31026	Linear & Digital IC Applications	30% replaced	A1EET211	Linear & Digital IC Applications
RT31027	Electrical Machines - II Lab	35% replaced	A1EEL204	Electrical Machines Lab - 2
RT31028	Control Systems Lab	15% replaced	A1EEL205	Control Systems Lab
RT31016	IPR & Patents	50% replaced	A1ACA509	Professional Ethics & IPR
RT32021	Microprocessors & Microcontrollers	60% replaced	A1EET217	Embedded Processors
RT32024	Power System Analysis	15% replaced	A1EET216	Computer Methods in Power Systems and Protection
RT32026	Power Semiconductor Drives	15% replaced	A1EET215	Power Semiconductor Drives
RT32025	Management Science	Removed	---	---
RT32027	Power Electronics Lab	15% replaced	A1EEL208	Power Electronics Lab
RT32028	Electrical Measurements Lab	30% replaced	A1EEL207	Electrical Measurements Lab
RT41021	Renewable Energy Sources and Systems	15% added	A1EET319	Renewable Energy Sources & Integration
RT41022	HVAC & DC Transmission	35% replaced	A1EET317	HVDC Transmission
RT41023	Power System Operation & Control	15% replaced	A1EET316	Power System Operation & Control
RT41024	Energy Audit, Conservation and Management	35% replaced	A1EET405	Energy Audit
RT41025	Instrumentation	Removed	---	---
RT41026	Non-conventional Sources of Energy	Removed	---	---
RT41027	Optimization Techniques	Removed	---	---
RT41028	VLSI Design	Removed	---	---
RT41029	Electrical Distribution Systems	Removed	---	---
RT41030	Optimization Techniques	Removed	---	---
RT4102L	Microprocessors & Microcontrollers Lab	50% replaced	A1EEL210	Embedded Processors lab
RT4102M	Electrical Simulation Lab	Removed	---	---

RT4102N	Power systems lab	25% replaced	A1EEL209	Power Systems Lab
RT42021	Digital Control Systems	10% replaced	A1EET310	Digital Control Systems
RT42022A	Advanced Control Systems	Removed	---	---
RT42022B	Extra High Voltage Transmission	Removed	---	---
RT42022C	Special Electrical Machines	15% replaced	A1EET305	Special Electrical Machines
RT42023A	Electric Power Quality	15% replaced	A1EET324	Power Quality
RT42023B	Digital Signal Processing	30% replaced	A1EET308	Digital Signal Processing
RT42024A	OOPS Through Java	5% replaced	A1CIT374	Object Oriented Programming with JAVA
RT42024B	UNIX and Shell Programming	Removed	---	---
RT42024C	AI Techniques	15% replaced	A1EET309	Artificial Intelligence Techniques
RT42024E	Systems Engineering	Removed	---	---
---	---	Introduced	A1CET001	Basics of Civil & Mechanical Engineering
---	---	Introduced	A1EET204	Signals & Systems
---	---	Introduced	A1EET218	Principles of Communication Systems
---	---	Introduced	A1EEP601	Directed Study
---	---	Introduced	A1EEL206	IC & PDC Lab
---	---	Introduced	A1CIT372	Data Structures
---	---	Introduced	A1EET302	Electrical Engineering Materials
---	---	Introduced	A1EET303	Electrical Safety
---	---	Introduced	A1CIT373	Computer Architecture
---	---	Introduced	A1EET306	Modern Control Systems
---	---	Introduced	A1EET307	Electrical Machine Design
---	---	Introduced	A1EET311	Distribution System Automation
---	---	Introduced	A1EET315	Condition Monitoring of Electrical Equipment
---	---	Introduced	A1EET318	Advanced Power Electronic Converters
---	---	Introduced	A1CIT375	Computer Networks
---	---	Introduced	A1EET323	Industrial Automation

---	---	Introduced	A1EHT101	Professional Communication
---	---	Introduced	A1EHT102	Business Communication
---	---	Introduced	A1MET103	Material Science
---	---	Introduced	A1PYT105	Electro Magnetic Theory
---	---	Introduced	A1CYT106	Instrumental Methods of Analysis
---	---	Introduced	A1MET107	Thermodynamics
---	---	Introduced	A1CYT108	Applied Analysis
---	---	Introduced	A1MAT109	Probability and Statistics
---	---	Introduced	A1PYT105	Basic Control Systems
---	---	Introduced	A1CYT106	Applied Electrical Engineering
---	---	Introduced	A1MET107	MATLAB
---	---	Introduced	A1CYT108	Electrical Safety
---	---	Introduced	A1EET406	Basic Automation Course
---	---	Introduced	A1EET407	Illumination Engineering
---	---	Introduced	A1EET408	Electrical Wiring, Estimation & Costing
---	---	Introduced	A1ACA501	NSS
---	---	Introduced	A1ACA502	NCC
---	---	Introduced	A1ACA503	Sports
---	---	Introduced	A1ACA504	Cultural
---	---	Introduced	A1ACA505	Yoga
---	---	Introduced	A1ACA506	Health & Nutrition
---	---	Introduced	A1ACA507	Entrepreneurship Development
---	---	Introduced	A1ACA508	Foreign Language (Chinese/Japanese/Korean/German)
---	---	Introduced	A1ACA510	Soft Skills - I
---	---	Introduced	A1ACA511	Soft Skills - II
---	---	Introduced	A1ACA512	General Aptitude

B.Tech(Mechanical)

A1 Regulation

I SEMESTER

S.No	Subject Code	Subject
1	A1MAT001	Engineering Mathematics – I
2	A1PYT001	Engineering Physics
3	A1CIT001	Computer Programming
4	A1MED001	Engineering Drawing
5	A1CHT001	Environment Studies
6	A1EHL001	English Language Practice– I
7	A1PYL001	Engineering Physics Laboratory
8	A1CIL001	Computer Programming Laboratory

II SEMESTER

S.No	Subject Code	Subject
1	A1MAT002	Mathematical Methods
2	A1CYT001	Engineering Chemistry
3	A1EET001	Basic Electrical & Electronics Engineering
4	A1MET001	Engineering Mechanics
5	A1XXT1XX	Foundation Elective – I
6	A1EHL002	English Language Practice – II
7	A1CYL001	Engineering Chemistry Laboratory
8	A1MEW001	Basic Engineering Workshop

III SEMESTER

S.No	Subject Code	Subject
1	A1MET201	Metallurgy and Material Science
2	A1MET202	Engineering Thermodynamics
3	A1MET203	Mechanics of Materials
4	A1MET204	Fluid Mechanics & Hydraulic Machines and Systems
5	A1MST001	Managerial Economics & Financial Analysis
6	A1MEL201	Material Testing Laboratory
7	A1EEL211	Basic Electrical & Electronics Engineering
8	A1MEL203	Computer Aided Engineering Drawing
9	A1EHA5XX	Audit Course - I

IV SEMESTER

S.No	Subject Code	Subject
1	A1XXT1XX	Foundation Elective – II
2	A1MET205	Kinematics of Machinery
3	A1MET206	IC Engines and Compressors
4	A1MED207	Machine Drawing
5	A1MET208	Manufacturing Processes
6	A1MET209	Industrial Engineering and Management
7	A1MEL204	Fluid mechanics & Hydraulic machines
8	A1MEL205	Production / Metallurgy Laboratory
9	A1EHA5XX	Audit Course – II

V SEMESTER

S.No	Subject Code	Subject
1	A1MET215	Heat Transfer
2	A1MET216	Design of Machine Members– II
3	A1MET217	Manufacturing Systems
4	A1METXXX	Core Elective – III
5	A1METXXX	Core Elective – IV
6	A1XXT4XX	Open Elective – I
7	A1MEL207	Machine Tools Laboratory
8	A1MEL208	CAD/CAE Laboratory
9	A1EHA5XX	Audit Course – V

VI SEMESTER

S.No	Subject Code	Subject
1	A1MET218	Operations Research
2	A1METXXX	Core Elective – V
3	A1METXXX	Core Elective – VI
4	A1METXXX	Core Elective – VII
5	A1METXXX	Core Elective – VIII (Self-Study)
6	A1XXT4XX	Open Elective – II
7	A1MEL209	Heat Transfer Laboratory
8	A1MEL210	Robotics and CNC Laboratory
9	A1EHA5XX	Audit Course – VI

VII SEMESTER

S.No	Subject Code	Subject
1	A1MET218	Operations Research
2	A1METXXX	Core Elective – V
3	A1METXXX	Core Elective – VI
4	A1METXXX	Core Elective – VII
5	A1METXXX	Core Elective – VIII (Self-Study)
6	A1XXT4XX	Open Elective – II
7	A1MEL209	Heat Transfer Laboratory
8	A1MEL210	Robotics and CNC Laboratory
9	A1EHA5XX	Audit Course – VI

A2 Regulation

I SEMESTER

S.No	Course Code	Course Title
1	A2MAT101	Mathematics-I
2	A2CYI101	Engineering Chemistry (Theory + Lab)
3	A2EEI201	Basic Electrical Engineering (Theory + Lab)
4	A2MEW201	Workshop
5	A2EHA701	Constitution of India

SEMESTER - II

S.No	Course Code	Course Title
1	A2MAT102	Mathematics-II
2	A2PYI101	Engineering Physics (Theory + Lab)
3	A2CII201	Programming for Problem Solving (Theory + Lab)
4	A2MED201	Computer Aided Engineering Graphics
5	A2EHL001	English-I

III SEMESTER

S.No	Course Code	Course Title
1	A2MAT106	Mathematics-III
2	A2CYT201	Biology for Engineers
3	A2EHL002	Communication in English For Deployability
4	A2EHT001	Professional Ethics and Human Values
5	A2MET301	Engineering Mechanics
6	A2MET302	Engineering Thermodynamics
7	A2MET303	Materials Engineering
8	A2MEL301	Computer aided geometric design and assembly
9	A2CHA701	Environmental Science

IV SEMESTER

S.No	Course Code	Course Title
1	A2MAT110	Mathematics-IV
2	A2CII201	AI Tools and Techniques
3	A2MET201	Design thinking and Product Innovation
4	A2MET304	Strength of Materials
5	A2MET305	Fluid Mechanics and Fluid Machines
6	A2MET306	Manufacturing Processes
7	A2MEL302	Materials Laboratory
8	A2MEP601	Socially Relevant Project
9	A2EHA702	Indian Traditional Knowledge

V SEMESTER

S.No	Subject Code	Subject
1	A2MET307	Theory of Machines
2	A2MET308	Design of Machine Elements
3	A2MET309	Internal Combustion Engines
4	A2MET310	Manufacturing Technology
5	A2MET202	Industrial Internet of Things (IIoT)
6	A2MET4XX	Professional Elective-I
7	A2XXT5XX	Open Elective-I
8	A2MEL303	Thermal Engineering Laboratory

VI SEMESTER

S.No	Subject Code	Subject
1	A2MET311	Computer Aided Design and Analysis
2	A2MET312	Applied Thermodynamics
3	A2MET313	Heat Transfer
4	A2MET001	Operations Research
5	A2MET4XX	Professional Elective-II
6	A2XXT5XX	Open Elective-II
7	A2MEL304	Simulation Laboratory
8	A2MEP602	Mini Project/Internship

VII SEMESTER

S.No	Subject Code	Subject
1	A2MET314	Metrology, Instrumentation and Control Systems
2	A2MEI301	Manufacturing Systems (Theory + Lab)
3	A2MET4XX	Professional Elective-III
4	A2MET4XX	Professional Elective-IV
5	A2MET4XX	Professional Elective-V
6	A2MET4XX	Professional Elective-VI
7	A2MEP603	Project phase-I

VIII SEMESTER		
S.No	**Subject Code**	**Subject**
1	A1MEP601	Directed Study
2	A1MEP602	Major Project

VIII SEMESTER		
S.No	**Subject Code**	**Subject**
1	A2XXT5XX	Open Elective-III (MOOCS)
2	A2XXT5XX	Open Elective-IV (MOOCS)
3	A2MEP604	Project phase-II

Foundation Elective – I & II		
S.No	**Subject Code**	**Subject**
1	A1EHT101	Professional Communication
2	A1EHT102	Business Communication
3	A1MET103	Material Science
4	A1MAT104	Engineering Mathematics II
5	A1PYT105	Electro Magnetic Theory
6	A1CYT106	Instrumental Methods of Analysis
7	A1MET107	Thermodynamics
8	A1CYT108	Applied Analysis
9	A1MAT109	Probability and Statistics
10	A1MAT110	Complex Variables & Statistical Methods
SNo	**Subject Code**	**Core Elective – I**
1	A1MET301	Automobile Engineering
2	A1MET302	Applications of Engineering Mechanics
3	A1MET303	Advanced Materials
4	A1MET304	Total Quality Management
SNo	**Subject Code**	**Core Elective – II**
1	A1MET305	Alternate Sources of Energy
2	A1MET306	Advanced Mechanics of Materials
3	A1MET307	Non Destructive Testing
4	A1MET308	Supply chain management
SNo	**Subject Code**	**Core Elective – III**
1	A1MET309	Energy Management
2	A1MET310	Robotics
3	A1MET311	Advanced Machining Processes
4	A1MET312	Industrial Safety
SNo	**Subject Code**	**Core Elective – IV**
1	A1MET313	Refrigeration and Air Conditioning
2	A1MET314	Finite Element Methods
3	A1MET315	Mechatronics
4	A1MET316	Leadership
SNo	**Subject Code**	**Core Elective – V**
1	A1MET317	Power Plant Engineering
2	A1MET318	Mechanical Vibrations and Condition Monitoring
3	A1MET319	Automation in Manufacturing
4	A1MET320	Production Planning and Control
SNo	**Subject Code**	**Core Elective – VI**
1	A1MET321	Computational Fluid Dynamics
2	A1MET322	Creep, Fatigue and Fracture mechanics
3	A1MET323	Product Lifecycle Management
4	A1MET324	Lean Six Sigma
SNo	**Subject Code**	**Core Elective – VII**
1	A1MET325	Engineering in Motion
2	A1MET326	Interactive Computer Graphics
3	A1MET327	Surface Engineering
4	A1MET328	Management Information Systems
SNo	**Subject Code**	**Core Elective – VIII**
1	A1MET329	Waste Heat Recovery and Co-generation
2	A1MET330	Introduction to Nanotechnology
3	A1MET331	Material Characterization Techniques
4	A1MET332	Instrumentation and Metrology
SNo	**Subject Code**	**List of Open Electives**
1	A1MET401	Introduction to Robotics
2	A1MET402	Alternative Fuels and Emissions
3	A1MET403	Production and Operations Management
4	A1MET404	Micro Electrical and Mechanical Systems
5	A1MET405	Product Design
6	A1MET406	Foundation of Computational Fluid Dynamics

Professional Elective-I		
S.No	Course Code	Course Title
1	A2MET401	Advanced Strength of Materials
2	A2MET402	Surface Engineering
3	A2MET403	Automobile Engineering
4	A2MET404	Design and Analysis of Experiments
Professional Elective-II		
S.No	Course Code	Course Title
1	A2MET405	Design of Transmission Systems
2	A2MET406	Leadership and Team Management
3	A2MET407	Aircraft and Jet Propulsion
4	A2MET408	Entrepreneurship

Professional Elective-III		
S.No	Course Code	Course Title
1	A2MET409	Finite Element Analysis
2	A2MET410	Composite Materials
3	A2MET411	Refrigeration and Air Conditioning
4	A2MET412	Industrial Engineering and Management

Professional Elective-IV		
S.No	Course Code	Course Title
1	A2MET413	Mechanical Vibrations & Condition Monitoring
2	A2MET414	Creep, Fatigue and Fracture Mechanics
3	A2MET415	Computational Fluid Dynamics
4	A2MET416	Automation in manufacturing

Professional Elective-V		
S.No	Course Code	Course Title
1	A2MET417	Mechatronic Systems & Robotics
2	A2MET418	Non Destructive Testing
3	A2MET419	Power Plant Engineering
4	A2MET420	Six Sigma

Professional Elective-VI		
S.No	Course Code	Course Title
1	A2MET421	Product Lifecycle Management Initiative
2	A2MET422	Process Planning and Cost Estimation
3	A2MET423	Renewable energy resources
4	A2MET424	Total Quality Management

OPEN ELECTIVES

Mechanical Department		
S.No	Course Code	Course Title
1	A2MET501	Introduction to Robotics
2	A2MET502	Solar and Wind Energy
3	A2MET503	Production and Operations Management
4	A2MET504	Micro Electro Mechanical Systems
5	A2MET505	Product Lifecycle Management
6	A2MET506	Foundation of Computational Fluid Dynamics

CSE & IT Department		
1	A2CIT501	Fundamentals of Data Structures
2	A2CIT502	Object Oriented Programming with JAVA
3	A2CIT503	Web Design & Development
4	A2CIT504	Python Programming
5	A2CIT505	NoSQL Databases
6	A2CIT506	Data Analytics
EEE Department		
1	A2EET501	Basic Control Systems
2	A2EET502	Applied Electrical Engineering
3	A2EET503	Electrical Safety
4	A2EET504	Concepts of Electrical Wiring
5	A2EET505	Basic Automation Course
6	A2EET506	Illumination Engineering
ECE Department		
1	A2ECT501	Principles of Communication Engineering
2	A2ECT502	Microcontrollers and Applications

Audit Course Electives		
S. No	Subject Code	Subject Name
1	A1ACA501	NSS
2	A1 ACA502	NCC
3	A1 ACA503	Sports
4	A1 ACA504	Cultural
5	A1 ACA505	Yoga
6	A1 ACA506	Health & Nutrition
7	A1 ACA507	Entrepreneurship Development
8	A1 ACA508	Foreign Language (Chinese/Japanese/Korean/German)
9	A1 ACA509	Professional Ethics & IPR
10	A1 ACA510	Soft Skills - I
11	A1 ACA511	Soft Skills - II
12	A1 ACA512	General Aptitude A1ACA512
13		MOOC

3	A2ECT503	Electronic Instrumentation
1	A2ECT504	Biomedical Engineering
2	A2ECT505	Transducers and Sensors
3	A1ECT506	Basics of VLSI Design
Chemical Engineering Department		
1	A2CHT501	Industrial Pollution Control & Engineering
2	A2CHT502	Renewable Energy Resources
3	A2CHT503	Solid Waste Management
1	A2CHT504	Energy Engineering
2	A2CHT505	Green Chemistry & Technology
3	A2CHT506	Air Pollution Control and Design of Equipment
1	A2CHT507	Industrial Waste Water Engineering
2	A2CHT508	Environmental Impact Assessment
3	A2CHT509	Computational Fluid Dynamics
1	A2CHT510	Bio Energy
2	A2CHT511	Energy Conservation and Management
3	A2CHT512	Design & Analysis of Experiments

Civil Engineering Department		
1	A2CET501	Remote sensing and GIS
2	A2CET502	Project Planning and Management
3	A2CET503	Road safety Engineering
4	A2CET504	Geomatics
5	A2CET505	Building services
6	A2CET506	Water Power Engineering
7	A2CET507	Solid waste management
8	A2CET508	Technology in Rural development

B.Tech(ECE)

Change document from R13 to A1

Department of ECE
MVGR College of Engineering (A)
Mapping of courses of R13 Regulation to Autonomous A1 Regulation

B.Tech:

JNTUK R13 Regulation				Autonomous A1 Regulation			
I Semester				Semester I			
S. No	**Subject**	**Credit**	**Remarks**	**S. No**	**Subject**	**Credit**	**Remarks**
1	English-I	3	-	1	Engineering Mathematics - I	3	✓
2	Mathematics-I	3	✓	2	Applied Physics	3	✓
3	Mathematics-II(Mathematical Methods)	3	✓ Is there in II Sem of A1 regulation	3	Basics of Civil & Mechanical Engineering	3	✓
4	Engineering Physics	3	✓	4	Fundamentals of Electronic Circuits and Devices	3	✓
5	Professional Ethics and Human Values	3	✓ Is there in IV Sem of A1 regulation Audit course – IV	5	Environmental Studies	3	✓
6	Engineering Drawing	3	✓Is there in II Sem of A1 regulation	6	English Language Practice -I	2	✓
7	English – Communication Skills Lab-1	2	✓	7	Applied Physics Lab	2	✓
8	Engineering Physics Laboratory	2	✓	8	Basic Engineering Workshop	2	✓
9	Engineering Physics – Virtual Labs - Assignments	-	-	9			
10	Engineering Workshop & IT Workshop	2	✓	10			
	Total Credits	**24**			**Total Credits**	**21**	

JNTUK R13 Regulation				Autonomous A1 Regulation			
II Semester				Semester II			
S. No	**Subject**	**Credit**	**Remarks**	**S. No**	**Subject**	**Credit**	**Remarks**
1	English-II	3	-	1	Mathematical Methods	3	✓
2	Mathematics-III	3	✓ Is there in Foundation Elective of A1 regulation	2	Engineering Drawing	3	✓
3	Engineering Chemistry	3	✓	3	Engineering Chemistry	3	✓
4	Engineering Mechanics	3	-	4	Electronic Devices and Circuits	3	✓
5	Computer Programming	3	✓ Is there in III Sem of A1 regulation	5	Network Analysis	3	✓
6	Network Analysis	3	✓	6	English Language Practice -II	2	✓
7	Engineering Chemistry Laboratory	2	✓	7	Engineering Chemistry Lab	2	✓
8	English – Communication Skills Lab -2	2	✓	8	Electronic Devices and Circuits Lab	2	✓
9	Computer Programming Lab	2	✓ Is there in III Sem of A1 regulation	9	**Audit course – I** General Aptitude	0	✓
	Total Credits	**24**			**Total Credits**	**21**	

JNTUK R13 Regulation				Autonomous A1 Regulation			
III Semester				Semester III			
S. No	**Subject**	**Credit**	**Remarks**	**S. No**	**Subject**	**Credit**	**Remarks**
1	Managerial Economics and Financial Analysis	3	✓	1	Managerial Economics and Financial Analysis	3	✓
2	Electronic Devices and Circuits	3	Is there in II Sem of A1 regulation	2	Computer Programming	3	✓
3	Data Structures	3	Is there in Core Elective I in IV Sem of A1 regulation	3	Electrical Technology	4	✓
4	Environmental Studies	3	Is there in I Sem of A1 regulation	4	Signals and Systems	4	✓
5	Signals & Systems	3	✓	5	Switching Theory & Logic Design	4	✓
6	Electrical Technology	3	✓	6	Foundation Elective – I 1. Professional Communication 2. Business Communication 3. Material Science 4. Engineering Mathematics II **5.** Electro Magnetic Theory	3	✓
7	Electronic Devices and Circuits Lab	2	Is there in II Sem of A1 regulation	7	Computer Programming Lab	2	✓
8	Networks & Electrical Technology Lab	2	✓	8	Electrical Technology & Networks Lab	2	✓
				9	**Audit course – II** Soft Skills - I	0	✓
	Total Credits	**22**			**Total Credits**	**25**	

JNTUK R13 Regulation				Autonomous A1 Regulation			
IV Semester				Semester IV			
S. No	**Subject**	**Credit**	**Remarks**	**S. No**	**Subject**	**Credit**	**Remarks**
1	Electronic Circuit Analysis	3	Is there in V Sem of A1 regulation	1	EM Waves and Transmission Lines	4	✓
2	Management Science	3	-	2	Pulse and Digital Circuits	4	✓
3	Random Variables & Stochastic Processes	3	✓	3	Analog Communications	4	✓
4	Switching Theory & Logic Design	3	✓	4	Random Variables and Stochastic Process	4	✓
5	EM Waves and Transmission Lines	3	✓	5	Switching Theory & Logic Design	4	✓
6	Analog Communications	3	✓	6	**Core Elective – I** 1. Data Structures 2. Programming with MAT Lab 3. Computer Organization & Architecture	4	✓
7	Electronic Circuit Analysis Lab	2	Is there in Electronic Circuit Analysis (Theory with hands-on) in V Sem of A1 regulation	7	**Foundation Elective – II** 1. Instrumental Methods of Analysis 2. Thermodynamics 3. Applied Analysis 4. Probability and Statistics 5. Complex Variables & Statistical Methods	3	✓
8	Analog Communications Lab	2	✓	8	Analog Communications Lab	2	✓
				9	Pulse and Digital Circuits Lab	2	✓
				10	**Audit course - III** Soft Skills - II	0	✓
	Total Credits	**22**			**Total Credits**	**31**	

JNTUK R13 Regulation				Autonomous A1 Regulation			
V Semester				Semester V			
S. No	**Subject**	**Credit**	**Remarks**	**S. No**	**Subject**	**Credit**	**Remarks**
1	Pulse & Digital Circuits	3	Is there in IV Sem of A1 regulation	1	Control Systems	4	✓
2	Linear IC Applications	3	Is there in V Sem as Linear and Digital IC applications of A1 regulation	2	Digital Communications	4	✓
3	Control Systems	3	✓	3	Antennas and Wave Propagation	4	✓
4	Digital System Design & Digital IC Applications	3	Is there in V Sem as Linear and Digital IC applications of A1 regulation	4	Linear and Digital IC Applications	4	✓
5	Antennas and Wave Propagation	3	✓	5	Microprocessors and Microcontrollers	4	✓
6	Pulse & Digital Circuits Lab	2	Is there in IV Sem of A1 regulation	6	**Core Elective – II** 1. Object Oriented Programming 2. Electronic Circuit Analysis 3. VI Using Lab VIEW	4	✓
7	LIC Applications Lab	2	Is there in V Sem as IC applications Lab of A1 regulation	7	Digital Communications Lab	2	✓
8	Digital System Design & DICA Lab	2	Is there in VI Sem as Digital System Design Lab of A1 regulation	8	IC Applications Lab	2	✓
9	IPR& Patents	2	Is there in V Sem as Audit Course of A1 regulation	9	**Audit course – IV** Professional Ethics & IPR	0	✓
	Total Credits	**23**			**Total Credits**	**28**	

JNTUK R13 Regulation				Autonomous A1 Regulation			
VI Semester				Semester VI			
S. No	**Subject**	**Credit**	**Remarks**	**S. No**	**Subject**	**Credit**	**Remarks**
1	Microprocessors and Microcontrollers	3	Is there in V Sem of A1 regulation	1	Digital Signal Processing	4	✓
2	Digital Signal Processing	3	✓	2	VLSI Design	4	✓
3	Digital Communications	3	Is there in V Sem of A1 regulation	3	**Core Elective – III** 1. Operating systems 2. Computer Networks **3.** Electronic Switching Systems	3	✓
4	Microwave Engineering	3	Is there in VII Sem of A1 regulation	4	**Core Elective – IV** 1. Information Theory and Coding 2. Embedded and Real Time Operating Systems 3. Cellular Mobile Communication	3	✓
5	**Open Elective** 1. Bio Medical Engineering 2. Fuzzy & Neural Networks	3	✓	5	**Core Elective – V** 1. Wireless Sensors & Networks 2. Artificial Intelligence & Neural Networks **3.** Optical Communication	3	✓
6	Microprocessors and Microcontrollers Lab	2	✓	6	**Open Elective – I** 1. Microcontrollers and Applications 2. Biomedical Engineering 3. Electronic Instrumentation	3	✓
7	Digital Communications Lab	2	Is there in V Sem of A1 regulation	7	Microprocessors and Microcontrollers Lab	2	✓
8	Digital Signal Processing Lab	2	Is there in VII Sem of A1 regulation	8	Digital System Design Lab	2	✓
9	Seminar	1	Replaced by Directed Study in VIII Sem of A1 regulation	9	**Audit course – V** Entrepreneurship Development	0	✓
	Total Credits	**22**			**Total Credits**	**24**	

JNTUK R13 Regulation				Autonomous A1 Regulation			
VII Semester				Semester VII			
S. No	**Subject**	**Credit**	**Remarks**	**S. No**	**Subject**	**Credit**	**Remarks**
1	VLSI Design	3	Is there in VI Sem of A1 regulation	1	Microwave Engineering	4	✓
2	Computer Networks	3	Is there in Core Elective in VI Sem of A1 regulation	2	Electronic Measurements and Instrumentation	4	✓
3	Digital Image Processing	3	Is there in VI Sem of A1 regulation	3	**Core Elective – VI** 1. Radar Systems 2. Satellite Communication 3. Digital Television	3	✓
4	Computer Architecture & Organization	3	Is there in IV Sem of A1 regulation	4	**Core Elective – VII** 1. Digital Image Processing 2. RF Circuit Design 3. Biomedical Instrumentation	3	✓
5	**Elective – I** 1. Electronic Switching Systems 2. Analog IC Design 3. Object Oriented Programming & O S 4. Radar Systems 5. Advanced Computer Architecture	3	✓	5	**Core Elective – VIII** 1. EMI / EMC 2. Analog IC Design **3.** Digital IC Design	3	✓
6	**Elective – II** 1. Optical Communication 2. Digital IC Design 3. Speech Processing 4. Artificial Neural Network & Fuzzy Logic 5. Network Security & Cryptography	3	✓	6	**Open Elective – II** 1. Principles of Communication Engineering 2. Transducers and Sensors **3.** Basics of VLSI Design	3	✓
7	V L S I Lab	2	Is there in VLSI Design (Theory and Lab) in VI Sem of A1 regulation	7	Microwave Engineering Lab	2	✓
8	Microwave Engineering Lab	2	✓	8	Digital Signal Processing Lab	2	✓
	Total Credits	**22**			**Total Credits**	**24**	

JNTUK R13 Regulation				Autonomous A1 Regulation			
VIII Semester				Semester VIII			
S. No	**Subject**	**Credit**	**Remarks**	**S. No**	**Subject**	**Credit**	**Remarks**
1	Cellular Mobile Communication	3	Is there in Core Elective in VI Sem of A1 regulation	1	Directed Study & Project	10	✓
2	Electronic Measurements and Instrumentation	3	Is there in VII Sem of A1 regulation	2	**Audit course - VI** Cultural	0	✓
3	**Elective III** 1. Satellite Communication 2. Mixed signal Design 3. Embedded systems 4. RF Circuit Design 5. Cloud Computing	3	✓				
4	**Elective IV** 1. Wireless Sensors and Networks 2. System on Chip 3. Low Power IC Design 4. Bio-Medical Instrumentation 5. EMI/EMC	3	✓				
5	Project & Seminar	9	✓				
	Total Credits	**21**			**Total Credits**	**10**	

1. From R13 regulation 4 courses English-I, English-II, Engineering Mechanics and Management Science with 12 credits were dropped in A1 regulation and these credits were compensated by giving more credits to core subjects in A1 regulation.
2. More electives were offered in A1 regulation compared to R13 regulation and also 5 audit courses were added to improve the skills in student.
3. In open electives,6 courses were offered in A1 regulation where as there are 2 subjects in R13 regulation.
4. In core electives 20 courses were offered in R13 regulation where as there are 26 subjects in A1 regulation.
5. Overall 25 percent variation is there between R13 and A1 regulation where 20 percent variation is due to courses variation and about 5 percent variation is due to internal syllabus change.

B.Tech(CSE)

Board of Studies
A1% Deviation Metric
2015

Main Category	Sub Category	A1				A2			
		Count	Credits	% Mod Dev	% Cre Dev	Count	Credits	% Mod Dev	% Cre Dev
Foundational Theory (Including Electives - 2)									
	Basic Sciences	5	15	-20	-20	7	21	28.571	28.57
	Humanties	3	9	-100	-100	4	11	25	18.18
	Engineering Sciences	4	12	50	50	5	15	20	20
SUM TOTAL		**12**	**36**	-16.667	-16.7	**16**	**47**	25	23.4
Foundational Labs									
	Basic Sciences	2	4	0	0	2	4	0	0
	Humanties	2	4	0	0	1	1	-100	-300
	Engineering Sciences	2	4	0	0	5	11	60	63.64
SUM TOTAL		**6**	**12**	0	0	**8**	**16**	25	25
Core Theory									
	Mandatory	18	72	-27.778	4.167	14	42	-28.571	-71.4
	Electives	8	24	50	50	6	18	-33.333	-33.3
SUM TOTAL		**26**	**96**	-3.8462	15.63	**20**	**60**	-30	-60
Core Labs									
	Mandatory	10	20	-70	-70	7	12	-42.857	-66.7
SUM TOTAL		**10**	**20**	-70	-70	**7**	**12**	-42.857	-66.7
Inter-Departmental (Open Electives)									
	Electives	2	6	100	100	4	12	50	50
SUM TOTAL		**2**	**6**	100	100	**4**	**12**	50	50
Audits		6	0	66.667		2	0	-200	
Seminar		0	0			0	0		
Project		1	10	0	10	4	13	75	23.08
WHOLE TOTAL		**63**	**180**	-9.5238	0	**61**	**160**	-3.2787	-12.5

B.Tech(Chemical)

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY KAKINADA B. TECH. CHEMICAL ENGINEERING (R – 13) CE/ME/CSE/IT/CHE/PE/PCE/AE/AME/MET/MIN

I Year

	I Semester	T	P	C		II Semester	T	P	C
1	English – I	3+1	--	3	1	English - II	3+1	--	3
2	Mathematics - I	3+1	--	3	2	Mathematics - II	3+1	--	3
3	Engineering Chemistry	3+1	--	3	3	Mathematics - III	3+1	--	3
4	Engineering Mechanics	3+1	--	3	4	Engineering Physics	3+1	--	3
5	Environmental Studies	3+1	--	3	5	Ethical & Moral Sciences	3+1	--	3
6	Computer Programming	3+1	--	3	6	Engineering Drawing	3+1	--	3
7	Engineering Chemistry Laboratory	--	3	2	7	English – Communication Skills Lab - II	--	3	2
8	English – Communication Skills Lab - I	--	3	2	8	Engineering Physics Laboratory	--	3	2
9	C Programming lab	--	3	2	9	Engineering Workshop & IT Workshop	--	3	2
				24					**24**

II Year

	I Semester	T	P	C		II Semester	T	P	C
1	Complex Variables	3+1		3	1	Probability & Statistics	3+1		3
2	Elements of Mechanical Engineering	3+1		3	2	Momentum Transfer	3+1		3
3	Electrical & Electronics Engineering	3+1		3	3	Mechanical Unit Operations	3		3
4	Organic Chemistry	3+1		3	4	Chemical Engineering Thermodynamics-I	3+1		3
5	Chemical Process Calculations	3+1		3	5	Inorganic Chemical Technology	3		3
6	Physical Chemistry	3		3	6	Materials Science & Engineering	3		3
7	Basic Engineering (Mech +Elec) Lab		3	2	7	Momentum Transfer Lab		3	2
8	Physical & Organic Chemistry Lab		3	2	8	Mechanical Unit Operations Lab		3	2
				22					**22**

III Year

	I Semester	T	P	C		II Semester	T	P	C
1	Process Heat Transfer	3+1		3	1	Management Science	3+1		3
2	Organic Chemical Technology	3+1		3	2	Mass Transfer Operations – II	3+1		3
3	Chemical Engineering Thermodynamics-II	3+1		3	3	Process Dynamics & Control	3+1		3
4	Chemical Reaction Engineering – I	3+1		3	4	Process Engineering Economics	3+1		3
5	Mass Transfer Operations-I	3+1		3	5	Chemical Reaction Engineering-II	3+1		3
6	Process Instrumentation	3+1		3	6	IPR & Patents	2		2
7	Process Heat Transfer Lab		3	2	7	Process Dynamics & Control Lab		3	2
8	Mass Transfer Operations Lab-I		3	2	8	Chemical Reaction Engineering Lab		3	2
					9	Mass Transfer Operations Lab-II		3	2
				22					**23**

IV Year

	I Semester	T	P	C		II Semester	T	P	C
1	Transport Phenomena	3+1		3	1	Industrial Safety & Hazard Management	3+1		3
2	Chemical Engineering Plant Design	3+1		3	2	Elective-II Multicomponent Distillation Fluidization Engineering Corrosion & Its Control	3+1		3
3	Process Modelling & Simulation	3+1		3					
4	Biochemical Engineering	3+1		3					
5	Open Elective (For the Students of other Branches) Industrial Pollution Control Engineering Design and Analysis of Experiments Green Fuel Technologies	3+1		3	3	Elective-III Computational Fluid Dynamics Optimization of Chemical Processes Computational Methods in Chemical Engineering	3+1		3
6	Elective –I Advanced Separation Technology Nanotechnology Polymer Technology	3+1		3	4	Elective-IV Catalysis Pipeline Engineering Process Trouble Shooting	3+1		3
7	Process Equipment Design & Drawing (Using Autocad) Lab		3	2	5	Project Work			9
8	Simulation Lab		3	2					
				22					**21**

DEPARTMENT OF CHEMICAL ENGINEERING
MVGR COLLEGE OF ENGINEERING: VIZIANAGARAM (A)
(Permanently affiliated to JNTU- Kakinada), Accredited by NBA, NAAC with A Grade

A1 REGULATIONS COURSE STRUCTURE

I SEMESTER:

S.No	Course code	Theory/Lab	L	T	P	C
1	A1MAT001	Engineering Mathematics-I	3	0	0	3
2	A1CYT002	Chemistry for Chemical Engineers	3	0	0	3
3	A1CIT001	Computer programming	3	0	0	3
4	A1CET001	Basics of Civil & Mechanical Engineering	3	0	0	3
5	A1CHT002	Introduction to Chemical Engineering	3	0	0	3
6	A1EHL001	English Language Practice –I	1	0	2	2
7	A1CYL001	Engineering Chemistry lab	0	0	3	2
8	A1CIL001	Computer programming Lab	0	0	3	2
		Total				**21**

II SEMESTER:

S.No	Course code	Theory/Lab	L	T	P	C
1	A1MAT002	Mathematical Methods	3	0	0	3
2	A1CHT001	Environmental Studies	3	0	0	3
3	A1PYT001	Engineering Physics	3	0	0	3
4	A1EET001	Basic Electrical and Electronics Engineering	3	0	0	3
5	A1MED001	Engineering. Drawing	3	0	0	3
6	A1EHL002	English Language Practice –II	1	0	2	2
7	A1PYL001	Engineering Physics Lab	0	0	3	2
8	A1MEW001	Basic Engineering Workshop	0	0	3	2
		Total				**21**

III SEMESTER:

S.No	Subject Code	Subject	L	T	P	C
1	A1CHT201	Material Science for Chemical Engineers	4	0	0	4
2	A1CHT202	Chemical Process Calculations	3	1	0	4
3	A1CHT203	Fluid Mechanics for Chemical Engineers	3	1	0	4
4	A1CHT204	Chemical Technology	4	0	0	4
5	A1CYT205	Organic Chemistry	4	0	0	4
6	A1XXT1XX	Foundation Elective-I	3	0	0	3
7	A1CHL201	Fluid Mechanics Lab for Chemical Engineers	0	0	3	2
8	A1CHL202	Chemical Technology Lab	0	0	3	2
9	A1EHA5XX	Audit Course-1	-	-	-	-
		Total				**27**

IV SEMESTER:

S.No	Subject Code	Subject	L	T	P	C
1	A1CHT206	Process Heat Transfer	3	1	0	4
2	A1CHT207	Chemical Engineering Thermodynamics-I	3	1	0	4
3	A1CHT208	Mechanical Unit Operations	3	1	0	4
4	A1CHT3XX	Core elective -I	3	0	0	3

5	A1XXT1XX	Foundation Elective-II	3	0	0	3
6	A1CHL203	Process Heat Transfer Lab	0	0	3	2
7	A1CHL204	Mechanical unit operations Lab	0	0	3	2
8	A1EHA5XX	Audit Course-2	-	-	-	
		Total				**22**

V SEMESTER:

S.No	Subject Code	Subject	L	T	P	C
1	A1CHT209	Process Instrumentation	3	0	0	3
2	A1CHT210	Chem. Engineering Thermodynamics-II	3	1	0	4
3	A1CHT211	Chemical Reaction Engineering-I	3	1	0	4
4	A1CHT212	Mass Transfer Operations-I	3	1	0	4
5	A1CHT3XX	Core Elective-II	3	0	0	3
6	A1CHT3XX	Core Elective-III	3	0	0	3
7	A1CHL205	Chemical Reaction Engineering. Lab	0	0	3	2
8	A1CHL206	Mass Transfer Operations Lab	0	0	3	2
9	A1EHA5XX	Audit Course - 3	-	-	-	-
10	A1EHA5XX	Audit Course - 4	-	-	-	-
		Total				**25**

VI SEMESTER:

S.No	Subject Code	Subject	L	T	P	C
1	A1CHT213	Mass Transfer Operations-II	3	1	0	4
2	A1CHT214	Process Dynamics & Control	3	1	0	4
3	A1CHT215	Chemical Reaction Engineering -II	3	1	0	4
4	A1CHT216	Process Modeling & Simulation	3	1	0	4
5	A1CHT3XX	Core Elective-IV	3	0	0	3
6	A1CHL207	Process Dynamics & Control Lab	0	0	3	2
7	A1CHL208	Process Modeling and Simulation lab using MATLAB	0	0	3	2
8	A1XXT4XX	Open Elective –I	3	0	0	3
9	A1EHA5XX	Audit Course - 5	-	-	-	-
		Total				
						26

VII SEMESTER:

S.No	Subject Code	Subject	L	T	P	C
1	A1MST001	Managerial Economics & Financial Analysis	3	0	0	3
2	A1CHT217	Transport Phenomena	3	1	0	4
3	A1CHT218	Plant Design & Economics for Chemical Engineers	3	1	0	4
4	A1CHT3XX	Core Elective – V	3	0	0	3
5	A1CHT3XX	Core Elective – VI	3	0	0	3
6	A1CHT3XX	Core Elective – VII	3	0	0	3
7	A1XXT4XX	Open Elective-II	3	0	0	3
8	A1CHD201	Process Equipment Design & Drawing using AutoCAD	0	0	3	2
9	A1EHA5XX	Audit Course-6	-	-	-	-

		Total				
						25

VIII SEMESTER:

S.No	Subject Code	Subject	L	T	P	C
1	A1CHT3XX	Core Elective – VIII (Self-study)	3	0	0	3
2	A1CHP601	Directed Study	0	0	0	2
3	A1CHP602	Project Work	0	0	0	8
		Total				
						13

Open Elective-I offered by Chemical Engineering Department to other Departments		
S.No	**Subject Code**	**Subject Name**
1	A1CHT401	Non-Conventional Sources of Energy
2	A1CHT402	Design & Analysis of Experiments
3	A1CHT403	Industrial Pollution Control & Engineering

Open Elective-II offered by Chemical Engineering Department to other Departments		
S.No	**Subject Code**	**Subject Name**
1	A1CHT404	Energy Engineering
2	A1CHT405	Green Chemistry & Technology
3	A1CHT406	Environmental Impact Assessment

Core Elective-I		
S.No	**Subject Code**	**Subject Name**
1	A1CHT301	Fertilizer Technology
2	A1CHT302	Petroleum Refining
3	A1CHT303	Polymer Technology

Core Elective-II		
S.No	**Subject Code**	**Subject Name**
1	A1CHT304	Paper Technology
2	A1CHT305	Fuel Cell Technology
3	A1CHT306	Industrial Pollution Control & Engineering

Core Elective-III		
S.No	**Subject Code**	**Subject Name**
1	A1CHT307	Ceramic Technology
2	A1CHT308	Petro Chemical Technology
3	A1CHT309	Nano Technology

Core Elective-IV		
S.No	**Subject Code**	**Subject Name**
1	A1CHT310	Food Technology
2	A1CHT311	Mineral Process Engineering
3	A1CHT312	Technology of Pharmaceuticals & Fine Chemicals

Core Elective-V

B.Tech(IT)

S.No	Subject Code	Subject Name
1	A1CHT313	Bio Chemical Engineering
2	A1CHT314	Project Management
3	A1CHT315	Process Intensification

Core Elective-VI		
S.No	**Subject Code**	**Subject Name**
1	A1CHT316	Industrial Bio Technology
2	A1CHT317	Corrosion & Control
3	A1CHT318	Optimization of Chemical Processes

Core Elective-VII		
S.No	**Subject Code**	**Subject Name**
1	A1CHT319	Fermentation Engineering
2	A1CHT320	Nuclear Reactor Engineering
3	A1CHT321	Industrial Safety & Hazard Management

Core Elective-VIII		
S.No	**Subject Code**	**Subject Name**
1	A1CHT322	Statistical Molecular Thermodynamics
2	A1CHT323	Organic Solar Cells
3	A1CHT324	Bio Electricity

Foundation Electives		
S.No	**Subject Code**	**Subject Name**
1	A1EHT101	Professional Communication
2	A1EHT102	Business Communication
3	A1PYT103	Material Science
4	A1MAT104	Engineering Mathematics-II
5	A1PYT105	Electromagnetic Theory
6	A1CYT106	Instrumental Methods of Analysis
7	A1MET107	Thermodynamics
8	A1CYT108	Applied Analysis
9	A1MAT109	Probability & Statistics
10	A1MAT110	Complex Variables & Statistical Methods

Audit Course Electives		
S.No	**Subject Code**	**Subject Name**
1	A1ACA501	NSS
2	A1ACA502	NCC
3	A1ACA503	Sports
4	A1ACA504	Cultural
5	A1ACA505	Yoga
6	A1ACA506	Health & Nutrition
7	A1ACA507	Entrepreneurship Development
8	A1ACA508	Foreign Language (Chinese / Japanese/ Korean/ German)
9	A1ACA509	Professional Ethics & IPR
10	A1ACA510	Soft Skills –I
11	A1ACA511	Soft Skills -II
12	A1ACA512	General Aptitude
13		MOOC

BOS A1 %Deviation Metric

Main Category	Sub Category	R13				A1			
		Count	Credits	% Mod Dev	% Cre Dev	Count	Credits	% Mod Dev	% Cre Dev
Foundational Theory (Including Electives - 2)									
	Basic Sciences	6	18	-16.667	22.22	5	15	-20	-20
	Humanties	6	18	16.667	22.22	3	9	-100	-100
	Engineering Sciences	2	6	-50	-33.3	4	12	50	50
SUM TOTAL		**14**	**42**	-7.1429	14.29	**12**	**36**	-16.667	-16.7
Foundational Labs									
	Basic Sciences	2	4	0	0	2	4	0	0
	Humanties	2	4	0	0	2	4	0	0
	Engineering Sciences	2	4	-100	-100	2	4	0	0
SUM TOTAL		**6**	**12**	-33.333	-33.3	**6**	**12**	0	0
Core Theory									
	Mandatory	23	69	-13.043	-50.7	18	72	-27.778	4.167
	Electives	4	12	0	-33.3	8	24	50	50
SUM TOTAL		**27**	**81**	-11.111	-48.1	**26**	**96**	-3.8462	15.63
Core Labs									
	Mandatory	17	34	47.059	47.06	10	20	-70	-70
SUM TOTAL		**17**	**34**	47.059	47.06	**10**	**20**	-70	-70
Inter-Departmental (Open Electives)									
	Electives	0	0			2	6	100	100
SUM TOTAL		**0**	**0**			**2**	**6**	100	100
Audits		2	0	-100		6	0	66.667	
Seminar		2	2			0	0		
Project		1	9	0	-33.3	1	10	0	10
WHOLE TOTAL		**69**	**180**	-1.4493	-15.6	**63**	**180**	-9.5238	0

4. FROM A1 TO R13 FOR APPLIED PHYSICS COURSE

- A new course titled "Applied Physics" has been introduced in the A1 regulation; which is common to EEE, ECE, CSE & IT disciplines, i.e. the circuit branches. The course is offered during the academic years 2015-16 to 2018-19.
- The contents of the course were derived fine tuning the existing Engineering Physics course of the R13 regulation of JNTU-K in-order to meet the program requirements of the circuit branches with reference to the newly introduced Choice Based Credit System (CBCS) of UGC.
- Regarding the Applied Physics Lab of the A1 regulation, experiments were designed in a way which is in well mapping with the course content delivered in the classroom. The experiments chosen focus on the vital concepts/topics of each unit and covering all the units of the course taught in classroom.

3. FROM A1 TO R13 FOR ENGINEERING PHYSICS COURSE

- The Engineering Physics course of the R13 regulation, JNTU-K is a single semester course and is common across all engineering disciplines. The course is offered for the years 2013-14 and 2014-15.
- The Engineering Physics course of the A1 regulation, MVGR is single semester course and is common for CIV, MEC & CHE disciplines. The course is offered during the academic years 2015-16 to 2018-19.
- Two new units/modules i.e. **Unit-5 THERMODYNAMICS** and **Unit-6 PRINCIPLES OF MECHANICS** were introduced in A1 regulation replacing **Unit-5 QUANTUM MECHANICS FOR ELECTRONIC TRANSPORT** and **Unit-6 SEMICONDUCTOR PHYSICS** of R13 regulation**.**
- The remaining units/modules i.e. Unit-1 to 4 were revised with few omissions and inclusions, including titular changes, to suit the corresponding program requirements with reference to the newly introduced Choice Based Credit System (CBCS) of UGC.
- The newly introduced Engineering Physics course of the A1 regulation deviates nearly by about **45%** in comparison with the earlier R13 regulation of JNTU-K.
- Concerning the Engineering Physics Lab of the A1 regulation, experiments were designed in a way which is in well mapping with the course content delivered in the classroom. The experiments chosen focus on the vital concepts/topics of each unit and covering all the units of the course taught in classroom.
- The newly introduced Engineering Physics lab course of the A1 regulation deviates nearly by about **70%** in comparison with the earlier R13 regulation of JNTU-K.

Minutes of the Board of Studies meeting held on 23.06.2015

Members Present: Signature

1. Prof A.V. Prasada Rao
   former Rector, A.U
   Academic Council Nominee

2. Dr. S. Salija Veni
   Assistant Professor, JNTU K
   University Nominee

3. N.V.S.S Raman — NOT PRESENT
   Senior Vice President Hetero drugs
   Academic council Nominee

4. Dr. T.V.N. Partha Sarathi
   HOD - chemistry & chairman BOS

5. Prof K.M.M. Krishna Prasad — Krishna Prasad
   Professor MVGRCE(A)

6. Dr. B. Sreerama Murty
   Professor MVGRCE(A) — 23/6

7. Mr. G. Ram Kumar
   Asst. Professor, MVGRCE(A) — 23/6

8. Dr. Abdul Razzak
   Asst. professor, MVGRCE(A) — 23/6

9. Mr. GVSR Pavan Kumar
   Asst. Professor, MVGRCE(A) — 23.6.15

10. Dr. Ch. V. Subba Rao
    Professor & HOD, CHE, MVGRCE(A)
    Special Invitee

The members on the BOS discussed the agenda and the following suggestions were given.

1. Based on the inputs given by various program coordinators, the department of chemistry has prepared and proposed syllabus for engineering chemistry and chemistry-II for chemical Engineers for I B.Tech students.
2. The syllabus for engineering chemistry proposed was presented and suggestions were incorporated.
   (A) In unit-II, Introduction to solid state battery is introduced before lithium ion battery.
   (B) In unit-VI the title of the unit is changed to chemistry of materials.
   (C) The topic green house effect is suggested to be deleted as it is being discussed in environmental studies, a separate course for all programs.
   (D) Synthesis of nano materials is suggested to be included.
   (E) The topic of types of cement is suggested to be introduced before the manufacture of portland cement.
   (F) The topic "Introduction to liquid crystals" is suggested to be introduced.
   (G) In the lab syllabus "determination of copper by colorimetry" is suggested to be replaced by the experiment "deter-

metry

(ii) List of Reference books by foriegn authors is suggested.

The above suggestions are considered and incorporated into the syllabus of Engineering for the programs

CSE, IT, EEE (I semester)

ECE, CIVIL, MECH (II semester)

3. One of the members suggested to make "Engineering chemistry" common to all programs whereas the department of chemical Engineering requested for the subject "chemistry for chemical engineers-I". The syllabus for which has three units Common to both Engineering chemistry and Chemistry for chemical Engineers-I. The following are the units III, IV and VI.

chemistry for chemical Engineers-I

IV. Distribution law and colloids.

V. chemical kinetics and catalysis

VI. Fundamentals of spectrophotometry and chromatography.

Engineering chemistry

III Corrosion

IV. High polymers

VI. chemistry of advanced materials.

The BOS of chemical Engineering stated that the units III, IV & VI under engineering chemistry were factored in as

a. polymer technology CE 4th sem Full length
b. Corrosion Engineering CE 7th sem Full length
c. cement and Nano materials CM 3rd sem chapters in a course.

CE - core Elective
CM - core mandatory.

The issue of Engineering chemistry subject common for all programs results in duplication repetition of syllabus for the chemical engineering B.Tech programs, therefore the same is referred back to BOS chemical Engineering for review and finalization. The outcomes for this review shall be placed in the college academic council for consideration.

4. Prof. A.V. Prasada Rao, suggested that the open electives by the department of chemistry for the programs may have another elective covering the topics Quality Control, Quality Assurance, GLP, statistical analysis, ISO etc., and the suggestion is well taken.
5. panel of paper setters, and Examiners for theory and lab are suggested to be prepared and circulated.
6. Prof. A.V. Prasada Rao and Dr. S. Saljaveni suggested that the assessment component shall be 70-30 instead of 60-40 for external and internal evaluation respectively. The suggestion is referred to academic Council.

7. Prof. A.V. Prasada Rao suggested that certain novel experiments to be introduced to develop creative thinking in the students and in this aspect it is suggested that the equipment "Ion chromatograph" and "AAS" be procured. The suggestion is well taken.

8. After discussion the chairman thanked all all the members for their active participation in the deliberations and the meeting is adjourned.

Head of the Department
Department of Chemistry
MVGR College of Engineering
Vizianagaram

M.Tech(Structural Engg)

DEPARTMENT OF CIVIL ENGINEERING

MVGR College of Engineering (Autonomous)

Accredited by NBA, NAAC with 'A' Grade of UGC, Approved by AICTE, New Delhi
Permanently Affiliated to JNTU, Kakinada, Listed U/S 2(f) & 12(B) of the UGC Act 1956
Vijayaram Nagar Campus, Chintalavalasa, Vizianagaram-535 005

Change document for Structural Engineering Curriculum

from JNTUK R13 Regulation to A1 Regulation

MTech Structural Engineering

M.Tech. I Semester

R13 Regulation			A1 Regulation		
S.No.	**Course**	**Credits**	**S.No.**	**Course**	**Credits**
1	Applied Mathematics	3	1	Advanced Mathematics	4
2	Theory of Elasticity	3	2	Theory of Elasticity	4
3	Matrix Analysis of Structures	3	3	Advanced Reinforced Concrete	4
4	Structural Dynamics	3	4	Structural Dynamics and Earthquake Resistant Design	4
5	**Elective –I** a) Experimental Stress Analysis b) Sub-Structure Design c) Structural Optimization	3	5	**Elective –I** Advanced Structural Analysis Industrial Structures Advanced Concrete Technology	3
6	**Elective – II** a) Repair and Rehabilitation of Structures b) Analysis and Design of Tall Buildings c) Plastic Analysis and Design	3	6	**Elective – II** Design of Tall Structures Disaster Management Theory of Plates and Shells	3
7	Advanced Structural Engineering Laboratory	2	7	Advanced Structural Engineering lab	2
Total Credits		**20**	**Total Credits**		**24**

M.Tech. II Semester

R13 Regulation			A1 Regulation		
S.No.	**Course**	**Credits**	**S.No.**	**Course**	**Credits**
1	Finite Element method	3	1	Substructure Design	4
2	Earthquake Resistant Design	3	2	Finite Element method	4
3	Stability of Structures	3	3	Stability of Structures	4
4	Theory of Plates & Shells	3	4	Prestressed Concrete	4
5	**Elective - III** a) Pre-stressed Concrete b) Mechanics of Composite Materials c) Fracture Mechanics	3	5	**Elective –III** Structural Optimization Bridge Engineering Repair and Rehabilitation of Structures	3
6	**Elective – IV** a) Industrial Structures b) Bridge Engineering c) Earth Retaining Structures	3	6	**Elective – IV** Structural Reliability Design of Hydraulic Structures Plastic analysis and Design of Steel Structures	3
7	CAD Laboratory	2	7	Computer Applications in Structural Engineering Laboratory	2
Total Credits		**20**	**Total Credits**		**24**

M.Tech. III Semester

R13 Regulation			A1 Regulation		
S.No.	**Course**	**Credits**	**S.No.**	**Course**	**Credits**
1	Seminar	2	1	Research Methodologies	2
2	Dissertation / Thesis	18	2	Comprehensive Viva	2
Total Credits		**20**	3	Pre-requisite Study	2
			4	Seminar	2
			5	Project Phase - I	8
			Total Credits		**16**

M.Tech. IV Semester

R13 Regulation			A1 Regulation		
S.No.	**Course**	**Credits**	**S.No.**	**Course**	**Credits**
1	Seminar	2	1	Project Phase - II	16
2	Dissertation / Thesis	18	**Total Credits**		**16**
Total Credits		**20**			

Changes in A1 Regulation in comparison with R13 regulation:

- In R13 Regulation, I semester to IV semester total number of credits per semester is 20 credits. In A1 regulation, I semester and II semester total number of credits per semester are 24 credits and III semester and IV semester total number of credits are made to be 16 credits.
- As per R 13 regulation, Dissertation / Thesis has 18 credits in III semester and 18 Credits in IV semester. Hence, in R 13 regulation, the total credits for Dissertation / Thesis is 36 Credits. In A1 regulation, Project phase I is carried out in III semester for which 8 credits are allotted and in IV semester, for Project Phase-II 16 credits are allotted. Now, in A1 regulation total credits for Project work is 24 credits.
- In R13 regulation Mandatory courses and Elective Courses have 3 credits and Laboratory courses have 2 credits. In A1 regulation, Mandatory courses have 4 credits and Elective courses have 3 credits and laboratory courses have 2 credits.
- Comprehensive viva voce is introduced in 3rd semester in A1 regulation for 2 credits.
- Research methodology course is offered in A1 regulation for 2 credits. Also, Pre-requisite study course is allotted 2 credits.
- In I Semester, mandatory course “Matrix analysis” course in R13 regulation is made as Elective course and renamed as “Advanced structural analysis” in A1 regulation.
- Structural dynamics and Earthquake resistant design are two different courses in R13 Regulation. In A1 Regulation, it is merged and renamed as “Structural Dynamics and Earthquake resistant design”.
- Theory of plates and shells course in R13 regulation is offered as Elective course in A1 Regulation.
- In R13 Regulation, Substructure design is offered as elective course. In A1, Substructure design course is offered as mandatory course in 2nd semester.
- CAD Laboratory in II semester of R13 regulation is renamed as “Computer Applications in Structural Engineering Laboratory”.
- Total number of credits in A1 regulation is maintained as 80 as in R13 regulations. Also the total number of core and elective courses are maintained in A1 regulations is same as that in R13 regulations.

M.Tech(Power Systems)

Course details under JNTUK (R13) Regulation		Percentage of Syllabus content added or replaced	Course details under Autonomous (A1) Regulation	
Course code	**Name of the Course**		**Course code**	**Name of the Course**
G5601	Microprocessors & Microcontrollers	Removed	---	---
G5602	HVDC Transmission	15% added	A1PST102	HVDC Transmission
G5603	Power System Operation and Control	40% replaced	A1PST101	Power System Operation and Control
G5604	Reactive Power Compensation & Management	Removed	---	---
G5605	Electrical Distribution Systems	Removed	---	---
G5606	HVAC Transmission	Removed	---	---
G5607	Analysis of Power Electronic Converters	Removed	---	---
G5610	Power System Security	Removed	---	---
G5611	Advanced Digital Signal Processing	Removed	---	---
G5612	Generation & Measurement of High Voltages	20% replaced	A1PST204	Generation & measurements of High Voltages
G5613	Programmable Logic Controllers & Applications	Removed	---	---
G5614	Modern Control Theory	20% replaced	A1PST203	Modern Control Systems
G5615	Simulation laboratory	50% replaced	A1PSL102	Simulation Laboratory
H5601	Power System Dynamics and Stability	60% replaced	A1PST105	Power System Dynamics
H5602	Flexible AC Transmission Systems	30% replaced	A1PST106	Flexible AC Transmission Systems
H5603	Real Time Control of Power Systems	Removed	---	---
H5607	Power System Reliability	60% replaced	A1PST210	Power System Planning and Reliability
H5608	Voltage Stability	Removed	---	---
H5611	Power System Transients	80% replaced	A1PST211	Power System transients
H5612	Demand Side Energy Management	Removed	---	---
H5613	Power Systems Laboratory	15% added	A1PSL101	Power Systems Laboratory
---	---	Introduced	A1PST103	Modeling & Simulation of Power Electronic Systems

---	---	Introduced	A1PST202	Digital Signal Processing
---	---	Introduced	A1PST201	Embedded Systems
---	---	Introduced	A1PST207	Distribution Automation
---	---	Introduced	A1PST208	Condition monitoring of Power apparatus
---	---	Introduced	A1PST109	Research Methodologies
---	---	Introduced	A1PSV401	Comprehensive Viva
---	---	Introduced	A1PSR401	Pre-requisite Study

M.Tech (PDM)

M.Tech Machine Design

R13 Regulations	A1 Regulations		
ISemester	**I Semester**		
Name of the Course	**S.No**	**Course code**	**Name of the course**
Computational methods in Engineering	1	A1 MDT101	Computational methods in Engineering
Advanced mechanics of solids	2	A1 MDT102	Principle of Design
Advanced Mechanisms	3	A1 MDT103	Advance d Mechanics of solids
Mechanical vibrations	4	A1 MDT104	Mechanical Behavoir of Materials
Design with advanced materials	5	A1 MDT2XX	**Elective- I**
Machine dynamics laboratory	6	A1 MDT 2XX	**Elective -II**
	7	**A1MDL101**	Machine Dynamics Laboratory

II Semester	**II Semester**		
Optimization & Reliabilty	1	A1MDT105	Advanced Mechanisms
Experimental stress analysis	2	A1MDT106	Mechanical Vibrations
Finite Element method	3	A1MDT107	Finite Element Analysis
Elelctive II	4	A1MDT108	Advanced Machine Design
Elective – III	5	A1MDT2XX	Elective – III
Elective – IV	6	A1MDT2XX	Elective – IV
Design Practical laboratory	7	A1MDL102	Design Practice Lab
III Semester	**III Semester**		
Seminar -I	1	A1MDT109	Research Methodologies
Comprehensive vivavoce	2	A1MDV401	Comprehensive Viva-Voce
Project Part-1	3	A1MDR401	Self-Study (Pre-requisite)
IV Semester	4	A1MDS501	Seminar
Seminar -II	5	A1MDP501	Project Phase - I
Project Part-II & VIvaVoce	**IV SEMESTER**		
	1	A1MDP502	Project Phase – II
Elective I	**Elective -I**		
Design of Automobile systems	1	A1MDT201	**Geometric Modelling**
Product Design	2	A1MDT202	Fracture Mechanics
Geometric Modelling	3	A1MDT203	Non Desctructive Evaluation
Non destructive evaluation	4	A1MDT204	Energy, the environment & out future (MOOCs),

Elelctive II	**Elective -II**		
Fracture mechanics	1	A1MDT205	Product Life Cycle Management
Gear Engineering	2	A1MDT206	Design with Advanced Materials
Design for manufacturing	3	A1MDT207	**Computational Fluid Dynamics**
Continuum mechanics	4	A1MDT208	Introduction to Programming with MAT Lab (MOOCs)
Elective III	**Elective III**		
Tribology	1	A1MDT209	Mechanics of Composite Materials and Nano Composites
Signal analysis & condition monitoring	2	A1MDT210	**Advance Optimization Techniques**
Computational flud dynamics	3	A1MDT211	Rapid Manufacturing Techniques
Elective IV	4	A1MDT212	Introduction to Acoustics (MOOCs)
Pressure vessel design	**Elective IV**		
Mechanics of composite materials	1	A1MDT213	Signal Analysis and Condition Monitoring
Mechatronics	2	A1MDT214	**Experimental Stress Analysis**
Theory of plasticity	3	A1MDT215	Mechatronics
	4	A1MDT216	Tribology (MOOCs)

M.Tech(VLSI)

Department of ECE
MVGR College of Engineering (A)
Mapping of courses of R13 Regulation to Autonomous A1 Regulation

M.Tech:

JNTUK R13 Regulation				Autonomous A1 Regulation			
I Semester				I Semester			
S. No	**Subject**	**Credit**	**Remarks**	**S. No**	**Subject**	**Credit**	**Remarks**
1	VLSI Technology and Design	3	✓	1	VLSI Technology	4	✓
2	CMOS Analog IC Design	3	✓	2	Analog IC Design	4	✓
3	CPLD and FPGA Architectures and Applications	3	✓	3	Digital IC Design	4	✓
4	CMOS Digital IC Design	3	✓	4	CPLD & FPGA Architecture and Applications	4	✓
5	**Elective I** 1. Digital System Design 2. Advanced Operating Systems 3. Soft Computing Techniques	3	✓	5	**Elective – I** 1. Digital System Design 2. MOS Device Modeling 3. System Modeling and Simulation	3	✓
6	**Elective II** 1. Digital Design using HDL 4 - 3 2. Advanced Computer Architecture 3. Hardware Software Co-Design	2	✓	6	**Elective – II** 1. Digital Design With Verilog HDL 2. VLSI signal processing 3. Logic Synthesis and Verification	3	✓
7	Laboratory VLSI Laboratory-I	2	-	7	FPGA Laboratory	2	✓
	Total Credits	**20**			**Total Credits**	**24**	

JNTUK R13 Regulation				Autonomous A1 Regulation			
II Semester				II Semester			
S. No	**Subject**	**Credit**	**Remarks**	**S. No**	**Subject**	**Credit**	**Remarks**
1	Low Power VLSI Design	3	✓	1	Low Power VLSI Design	4	✓
2	CMOS Mixed Signal Circuit Design	3	✓	2	CMOS Mixed Signal VLSI Design	4	✓
3	CAD for VLSI	3	-	3	Testing and Testability	4	✓
4	Design For Testability	3	✓	4	VLSI Physical Design Automation	4	✓
5	Elective III 1. Scripting Languages 4 - 3 2. Digital Signal Processors & Architectures 3. VLSI Signal Processing	3	-	5	**Elective – III** 1. Custom IC Design 2. Hardware Software Co-Design 3. DSP Processors and Architectures	3	✓
6	Elective IV 1. System on Chip Design 2. Optimization Techniques in VLSI Design 3. Semiconductor Memory Design and Testing	3	✓	6	**Elective – IV** 1. Scripting Languages 2. Optimization Techniques and applications to VLSI 3. Semiconductor Memory Design and Testing	3	✓
7	Laboratory VLSI Laboratory-II	2	-	7	Custom IC Design Laboratory	2	✓
	Total Credits	**20**			**Total Credits**	**24**	

JNTUK R13 Regulation				Autonomous A1 Regulation			
III Semester				III Semester			
S. No	**Subject**	**Credit**	**Remarks**	**S. No**	**Subject**	**Credit**	**Remarks**
1	Seminar	2	✓	1	Research Methodologies	2	✓
2	Project	18	✓	2	Comprehensive Viva-Voce	2	✓
				3	Self-Study (Pre-requisite)	2	✓
				4	Seminar	2	✓
				5	Project Phase – I	8	✓
	Total Credits	**20**			**Total Credits**	**16**	

JNTUK R13 Regulation				Autonomous A1 Regulation			
IV Semester				IV Semester			
S. No	**Subject**	**Credit**	**Remarks**	**S. No**	**Subject**	**Credit**	**Remarks**
1	Seminar	2	✓	1	Project Phase – II	16	✓
2	Project	18	✓				
	Total Credits	**20**			**Total Credits**	**16**	

1. From R13 regulation 2 labs VLSI Laboratory-I and VLSI Laboratory-II were dropped and 2 new labs FPGA Laboratory and Custom IC Design Laboratory were introduced with same number of credits in A1 regulation .
2. Three electives Scripting Languages, Digital Signal Processors & Architectures and VLSI Signal Processing were offered in R13 regulation whereas Custom IC Design, Hardware Software Co-Design and DSP Processors and Architectures were included in A1regulation.
3. In R13 regulation only seminar and project are included. In addition to project and seminar, Research Methodologies, Comprehensive Viva-Voce, Self-Study (Pre-requisite) were included in A1 Regulation.
4. Overall 25 percent variation is there between R13 and A1 regulation where 20 percent variation is due to courses variation and about 5 percent variation is due to internal syllabus change.

MBA

Percentage of programs where syllabus revision was carried out during the last five years (20)

In the past 5 years courses, credits and syllabus were revised in the academic Years 2015-16 and 2019-20. Following are the details of the syllabus revisions for the mentioned academic years.

SYLLABUS REVISION 2015-16

For the academic year 2015-16 MBA program was restructured with all inputs and discussion in Board of Studies of Department of Management Studies (DMS) in the beginning of the academic year 2015-16. The same was ratified with common consent of all BoS members on 10th June 2015. Minutes of the BOS meeting is attached. The syllabus is revised for all the courses and the course structure is as follows.

Table 1.1.2 A – Academic Year 2015-16

Area	Courses	Credits	%
Foundation Courses	6	18	22.50%
Core Mandatory Courses	8	24	30.00%
Core Elective Courses	6	**18**	22.50%
Open Elective Courses	3	**9**	11.25%
Project Viva Voce	1	6	7.50%
Comprehensive Viva	1	1	1.25%
Labs	2	4	5.00%
Total	**27**	**80**	**100.00%**

Change document from A1 to A2
All Programmes

B.Tech(Civil)

DEPARTMENT OF CIVIL ENGINEERING

MVGR College of Engineering (Autonomous)

Accredited by NBA, NAAC with 'A' Grade of UGC, Approved by AICTE, New Delhi
Permanently Affiliated to JNTU, Kakinada, Listed U/S 2(f) & 12(B) of the UGC Act 1956
Vijayaram Nagar Campus, Chintalavalasa, Vizianagaram-535 005

Change document for Civil Engineering Curriculum

from A1 Regulation to A2 Regulation

BTech Civil Engineering

1st Year 1st Semester					
A1 Regulation			A2 Regulation		
S. No.	Subject	Credits	S. No.	Subject	Credits
1	Engineering Mathematics – I	3	1	Mathematics-I	3
2	Engineering Physics	3	2	Engineering Chemistry (Theory + Lab)	5
3	Computer Programming	3	3	Basic Electrical Engineering (Theory + Lab)	5
4	Engineering Drawing	3	4	Workshop	2
5	Environmental Studies	3	5	Constitution of India	0
6	English Language Practice – I	2			
7	Engineering Physics Laboratory	2			
8	Computer Programming Laboratory	2			
9					
	Total Credits		**21**	**Total Credits**	**15**

1st Year 2nd Semester					
A1 Regulation			**A2 Regulation**		
S. No.	**Subject**	**Credits**	**S. No.**	**Subject**	**Credits**
1	Mathematical Methods	3	1	Mathematics-II	3
2	Engineering Chemistry	3	2	Engineering Physics (Theory + Lab)	5
3	Basic Electrical and Electronics Engineering	3	3	Programming for Problem Solving (Theory + Lab)	5
4	Applied Mechanics	3	4	Computer Aided Engineering Graphics	3
5	Foundation Elective I	3	5	English-I	3
6	English Language Practice – II	2			
7	Engineering Chemistry Laboratory	2			
8	Basic Engineering Workshop	2			
9					
	Total Credits	**21**			**19**

2nd Year 1st Semester					
A1 Regulation			A2 Regulation		
S. No.	Subject	Credits	S. No.	Subject	Credits
1	Strength of Materials-I	4	1	English-II (Technical English)	3
2	Elements of Surveying	4	2	Mathematics-III	3
3	Fluid Mechanics	4	3	AI Tools, Techniques & Applications (Theory + Lab)	5
4	Building Materials and Concrete Technology	4	4	Internet of Things (IoT) for Civil Engineers	3
5	Managerial Economics & Financial Analysis	3	5	Engineering Mechanics	3
6	Foundation Elective II	3	6	Fluid Mechanics & Hydraulic Machines (Theory +Lab)	5
7	Surveying Laboratory	2	7	Surveying & Geomatics	3
8	Fluid Mechanics Laboratory	2	8	Environmental Science	0
	Audit Course 1				
	Total Credits	**26**			**25**

2nd Year 2nd Semester					
A1 Regulation			A2 Regulation		
S. No.	Subject	Credits	S. No.	Subject	Credits
1	Strength of Materials-II	4	1	Mathematics-IV	3
2	Hydraulics and Hydraulic Machinery	4	2	Biology for Engineers	3
3	Structural Analysis	4	3	Design Thinking and Product Innovation	3
4	Building Planning & Civil Engineering Drawing	4	4	Strength of Materials (Theory+Lab)	4.5
5	Core Elective I	3	5	Building Planning and Project Management	3
6	Strength of Materials Laboratory	2	6	Materials, Testing and Evaluation (Theory+Lab)	4.5
7	Hydraulic Machinery Laboratory	2	7	Indian Traditional Knowledge	0
8	Audit Course 2				
9					
	Total Credits	**23**		**Total Credits**	**21**

3rd Year 1st Semester					
A1 Regulation			**A2 Regulation**		
S. No.	**Subject**	**Credits**	**S. No.**	**Subject**	**Credits**
1	Water Resources Engineering	4	1	Structural Analysis (Including STAAD. Pro.) (Theory + Lab)	4
2	Design of Reinforced Concrete Structures	4	2	Soil Mechanics (Theory +Lab)	4.5
3	Transportation Engineering	4	3	Basic Reinforced Concrete Design	3
4	Geotechnical Engineering	4	4	**Professional Elective-1** Advanced Concrete Technology/ Open Channel Hydraulics/ Civil Infrastructure for Smart City Development/ Advanced Surveying/ MOOCs	3
5	Environmental Engineering I	4			
6	Open Elective I	3			
7	Concrete Technology Laboratory	2			
8	Engineering Geology Laboratory	2	5	Open Elective – I /MOOCs	3
	Audit Course 3		6	Open Elective – II /MOOCs	3
			7	Mini Project	2
Total Credits		**27**		**Total Credits**	**22.5**

3rd Year 2nd Semester					
A1 Regulation			A2 Regulation		
S. No.	Subject	Credits	S. No.	Subject	Credits
1	Design of Steel Structures	4	1	Managerial Economics & Financial Analysis	3
2	Advanced Reinforced Concrete Structures	4	2	Environmental Engineering (Theory + Lab)	4.5
3	Foundation Engineering	4	3	Design of Steel Structures	3
4	Environmental Engineering II	4	4	Highway Engineering	3
5	Core Elective II	3	5	Water Resources Engineering	3
6	Open Elective II	3	6	**Professional Elective-II** Advanced Structural Analysis/ Remote Sensing and GIS/ Ground Improvement Techniques/ Engineering Geology/ MOOCs	3
7	Transportation Engineering Laboratory	2	7	**Professional Elective-III** Advanced Reinforced Concrete Design/ Disaster Management/ Advanced Fluid Mechanics/ Environmental Impact Assessment/ MOOCs	3
8	Geotechnical Engineering Laboratory	2			
	Audit Course 4				
	Audit Course 5				
Total Credits		**26**		**Total Credits**	**22.5**

4th Year 1st Semester					
A1 Regulation			A2 Regulation		
S. No.	Subject	Credits	S. No.	Subject	Credits
1	Estimation and Contracts	4	1	Professional Ethics and Human Values	3
2	Core Elective III	3	2	Estimation & Costing	3
3	Core Elective IV	3	3	Foundation Engineering	3
4	Core Elective V	3	4	**Professional Elective – IV** Repair and Rehabilitation of Structures/ Water Resources System Planning &Management/ Railways, Airports and Harbours/ Advanced Environmental Engineering/ MOOCs	3
5	Core Elective VI	3	5	**Professional Elective - V** Reinforced Soil Structures/ Environmental Economics/ Traffic Engineering and Transport Planning/ Ground Water Development and Mgmt/ MOOCs	3
6	Core Elective VII	3	6	**Professional Elective – VI** Finite Element Method/ Building Construction and Services/ Air Pollution Engg/ Irrigation Engineering and	3

				Hydraulic Structures/ MOOCs	
7	Core Elective VIII / Self study	3	7	Socially Relevant Project	1
8	GIS and CAD Lab	2	8	Project Phase-I	2
	Environmental Engineering Laboratory	2			
	Total Credits	**26**		**Total Credits**	**21**

4th Year 2nd Semester					
A1 Regulation			**A2 Regulation**		
S. No.	**Subject**	**Credits**	**S. No.**	**Subject**	**Credits**
1	Directed Study and Project Work	10	1	Open Elective – III/ MOOCs	3
2	Audit Course-6		2	Open Elective – IV/ MOOCs	3
			3	Project Phase – II	8
Total Credits		**10**			**14**

Changes in A2 Regulation curriculum in comparison with R13 Regulation

- In A2 Regulation, the total number of credits is set at 160 compared to 180 credits in A1 Regulation. This is essentially done to implement the AICTE Model Curriculum in true spirit.
- The total number of credits in the 1st and 2nd Semester is 34 compared to 42; 3rd and 4th Semesters is 46 compared to 49; 5th and 6th Semesters is 45 compared to 53; 7th and 8th Semesters is 35 compared to 36 in A1 Regulation.
- Integrated courses are introduced in A2 Regulation where Theory Course and Lab Course are fused together to give a better understanding of the theoretical concepts discussed in the Theory course.
- Integrated courses in the A2 Regulation under Basic Sciences are "Engineering Chemistry (Theory + Lab), Basic Electrical Engineering (Theory + Lab), Engineering Physics (Theory + Lab), Programming for Problem Solving (Theory + Lab)".
- Integrated courses in the A2 Regulation under Core Courses are "Fluid Mechanics & Hydraulic Machines (Theory +Lab), Strength of Materials (Theory+Lab), Materials, Testing and Evaluation (Theory+Lab), Structural Analysis (Including STAAD. Pro.) (Theory + Lab), Soil Mechanics (Theory +Lab), Environmental Engineering (Theory + Lab)".
- In addition to the Core courses, other courses such as Constitution of India, Biology for Engineers, Indian Traditional Knowledge are introduced as mandatory Audit Courses as per recommendations of AICTE Model Curriculum.
- The number of credits for Integrated Courses are set at 4.5 whereas Theory courses are set at 3.
- The number of credits for Laboratory courses are increased to 3 credits compared to 2 credits in A1 Regulation.
- Some of the traditionally mandatory courses are included in Professional Electives due to reduction in credits.
- In addition to the Core Mandatory, Professional Elective, and Audit Courses, 3 new courses "AI Tools, Techniques and Applications", "Design Thinking", and

"IoT for Civil Engineers" are introduced as per recommendations of AICTE Model Curriculum.

- A new course Socially Relevant Project is introduced in 7th Semester to encourage students to take up relevant social issues that can be addressed.
- Project Work is divided into 2 phases as Project Phase-I and Project Phase-II in 7th and 8th Semesters for 2 and 8 credits respectively.
- Student can opt for MOOCs courses in all Professional Electives in place of the courses offered by the Department.
- Internal Marks in A2 Regulation are set at 40 similar to A1 Regulation, Quiz exams are introduced for 10 Marks and added to Mid-term exams which are conducted for 30 Marks and reduced to 20 Marks. Overall, Internal Assessment is done for 30 Marks (Quiz and Mid-term) and averaged over 2 Internal Exams conducted in the middle and end of the semester. Internal assessment exams will have 3 questions. Assignments/ Surprise test/ Quiz or a combination of these are assessed for a total 10 Marks.
- End Semester Examination is conducted for 60 Marks. Question paper contains 10 questions with 2 questions from each unit with Internal Choice.

B.Tech(EEE)

Course details under Autonomous (A1) Regulation		% of Syllabus content added or replaced	Course details under Autonomous (A2) Regulation	
Course code	**Name of the Course**		**Course code**	**Name of the Course**
A1MAT001	Engineering Mathematics - 1	40% replaced	A2MAT001	Mathematics - I
A1MAT002	Mathematical Methods	60% replaced	A2MAT102	Mathematics – II
A1ACA509	Professional Ethics & IPR	40% replaced	A2EHT001	Professional Ethics and Human Values
A1MED001	Engineering Drawing	20% replaced	A2MED201	Computer Aided Engineering Graphics
A1EHL001	English Language Practice – I	Removed	---	---
A1EHL002	English Language Practice – I	Removed	---	---
A1PYT002 & A1PYL002	Applied Physics and Physics Lab	20% replaced	A2PYI102	Applied Physics (Theory + Lab)
A1CYT001 & A1CYL001	Engineering Chemistry and Engineering Chemistry Lab	30% replaced	A2CYI101	Engineering Chemistry (Theory + Lab)
A1MEW001	Basic Engineering Workshop	65% replaced	A2EEW201	Engineering Workshop (Electrical)
A1EET002	Electrical Circuit Analysis – 1 + Electrical Circuit Analysis – 2	5% replaced	A2EEI301	Electrical Circuit Analysis
A1EET206	Electronics Devices & Circuits - 2	Removed	---	---
A1MAT110	Complex Variables & Statistical Methods	Removed	---	---
A1EET205	Electrical Machines - 1	20% replaced	A2EEI303	Electrical Machines - 1
A1EET209	Digital Electronics	5% replaced	A2EET302	Digital Electronics
A1EET208	Power Generation & Control	Removed	---	---
A1EET214	Electrical Measurements & Instrumentation	10% replaced	A2EEI308	Electrical Measurements & Instrumentation
A1EET212	Power Electronics	5% replaced	A2EEI306	Power Electronics
A1EET213	Power Transmission and Distribution	5% replaced	A2EET303	Power Transmission & Distribution
A1EET211	Linear & Digital IC Applications	Removed	---	---
A1EET320	Switchgear & Protection	5% added	A2EET305	Switchgear & protection
A1EET217	Embedded Processors	30% replaced	A2EEI403	Embedded Processors

A1EET317	HVDC Transmission	20% replaced	A2EET407	HVDC Transmission
A1EET408	Electrical Wiring, Estimation & Costing	15% replaced	A2EET402	Electrical Wiring Design & Estimation
A1EET316	Power System Operation & Control	20% replaced	A2EET413	Power System Operation & Control
A1EET314	Utilization of Electrical Energy	5% added	A2EET403	Utilization of Electrical Energy
A1EET319	Renewable Energy Sources & Integration	10% replaced	A2EET409	Renewable Energy Systems & Integration
A1EET405	Energy Audit	10% added	A2EET408	Energy Audit, Conservation & Management
A1EET305	Special Electrical Machines	10% added	A2EET410	Special Electrical Machines
A1EET324	Power Quality	Removed	---	---
A1EET308	Digital Signal Processing	15% replaced	A2EET406	Digital Signal Processing
A1CIT374	Object Oriented Programming with JAVA	Removed	---	---
A1EET309	Artificial Intelligence Techniques	20% replaced	A2EEI202	AI Tools, Techniques & Applications
A1EET312	Power System Restructuring	Removed	---	---
A1CET001	Basics of Civil & Mechanical Engineering	Removed	---	---
A1EET204	Signals & Systems	10% replaced	A2EET401	Signals & Systems
A1EET218	Principles of Communication Systems	Removed	---	---
A1EEP601	Directed Study	Removed	---	---
A1EEL206	IC & PDC Lab	Removed	---	---
A1CIT372	Data Structures	Removed	---	---
A1EET302	Electrical Engineering Materials	Removed	---	---
A1EET303	Electrical Safety	Removed	---	---
A1CIT373	Computer Architecture	Removed	---	---
A1EET306	Modern Control Systems	Removed	---	---
A1EET307	Electrical Machine Design	Removed	---	---
A1EET311	Distribution System Automation	Removed	---	---
A1EET318	Advanced Power Electronic Converters	60% replaced	A2EET411	Advanced Power Electronic Converters

A1CIT375	Computer Networks	Removed	---	---
A1EET323	Industrial Automation	Removed	---	---
A1EET403	MATLAB	Removed	---	---
A1EHT101	Professional Communication	Removed	---	---
A1EHT102	Business Communication	Removed	---	---
A1MET103	Material Science	Removed	---	---
A1PYT105	Electro Magnetic Theory	Removed	---	---
A1CYT106	Instrumental Methods of Analysis	Removed	---	---
A1MET107	Thermodynamics	Removed	---	---
A1CYT108	Applied Analysis	Removed	---	---
A1MAT109	Probability and Statistics	Removed	---	---
A1ACA501	NSS	Removed	---	---
A1ACA502	NCC	Removed	---	---
A1ACA503	Sports	Removed	---	---
A1ACA504	Cultural	Removed	---	---
A1ACA505	Yoga	Removed	---	---
A1ACA506	Health & Nutrition	Removed	---	---
A1ACA507	Entrepreneurship Development	Removed	---	---
A1ACA508	Foreign Language (Chinese/Japanese/Korean/German)	Removed	---	---
A1ACA510	Soft Skills – I	Removed	---	---
A1ACA511	Soft Skills – II	Removed	---	---
A1ACA512	General Aptitude	Removed	---	---
A1MAT110	Complex Variables & Statistical Methods	Removed	---	---
---	---	Introduced	A2EEI201	Basic Electrical Engineering (Theory + Lab)
---	---	Introduced	A2EHA701	Constitution of India
---	---	Introduced	A2EHA702	Indian Traditional Knowledge
---	---	Introduced	A2XXT101	Biology for Engineers

---	---	Introduced	A2EET202	Design Thinking
---	---	Introduced	A2EET201	Internet of Things
---	---	Introduced	A2EET411	Advanced Control Systems
---	---	Introduced	A2EET415	Electrical Vehicle Technology
---	---	Introduced	A2EEP601	Socially relevant Project
---	---	Introduced	A2EET404	Linear System Analysis
---	---	Introduced	A2EEP602	Mini Project
---	---	Introduced	A2EEI402	Programming with Lab VIEW
---	---	Introduced	A2EET504	Concepts of Electrical Wiring
---	---	Introduced	A2MAT109	Mathematics - IV
---	---	Introduced	A2EEI307	Microprocessors & Microcontrollers
---	---	Introduced	A2EET414	Electrical Distribution Systems
---	---	Introduced	A2EHL001	English - I
---	---	Introduced	A2EHL002	English - II
---	---	Introduced	A2EEI401	MATLAB programming and Simulink

B.Tech(Mechanical)

Mechanical Engineering

R13 Regulation

I Year – I SEMESTER

S.No	Subject
1	English – I
2	Mathematics - I
3	Engineering Chemistry
4	Engineering Mechanics
5	Computer Programming
6	Environmental Studies
7	Engineering Chemistry Laboratory
8	English - Communication Skills Lab - I
9	C Programming Lab

I Year – II SEMESTER

S.No	Subject
1	English – II
2	Mathematics – II
3	Mathematical Methods
4	Engineering Physics
5	Professional Ethics and Human Values
6	**Engineering Drawing**
7	English - Communication Skills Lab - II
8	Engineering Physics Lab
9	Engg.Workshop & IT Workshop

II Year – I SEMESTER

S.No	Subject
1	Managerial Economics and Financial Accountancy (MEFA)
2	Mechanics of Solids (MOS)
3	Computer Aided Engineering Drawing (CAED)
4	Metallurgy and Material Science (MMS)
5	Thermodynamics (TD)
6	Electrical Engineering (EE)
7	Mechanics of Solids Lab (MOS Lab)
8	Metallurgy and Material Science Lab (MMS Lab)
9	Electrical Engineering Lab (EE Lab)

A1 Regulation

I Year – I SEMESTER

S.No	Subject Code	Subject
1	A1MAT001	Engineering Mathematics – I
2	A1PYT001	Engineering Physics
3	A1CIT001	Computer Programming
4	A1MED001	Engineering Drawing
5	A1CHT001	Environment Studies
6	A1EHL001	English Language Practice– I
7	A1PYL001	Engineering Physics Laboratory
8	A1CIL001	Computer Programming Laboratory

I Year – II SEMESTER

S.No	Subject Code	Subject
1	A1MAT002	Mathematical Methods
2	A1CYT001	Engineering Chemistry
3	A1EET001	Basic Electrical & Electronics Engineering
4	A1MET001	Engineering Mechanics
5	A1XXT1XX	Foundation Elective – I
6	A1EHL002	English Language Practice – II
7	A1CYL001	Engineering Chemistry Laboratory
8	A1MEW001	Basic Engineering Workshop

II Year – I SEMESTER

S.No	Subject Code	Subject
1	A1MET201	Metallurgy and Material Science
2	A1MET202	Engineering Thermodynamics
3	A1MET203	Mechanics of Materials
4	A1MET204	Fluid Mechanics & Hydraulic Machines and Systems
5	A1MST001	Managerial Economics & Financial Analysis
6	A1MEL201	Material Testing Laboratory
7	A1EEL211	Basic Electrical & Electronics Engineering Laboratory
8	A1MEL203	Computer Aided Engineering Drawing Laboratory
9	A1EHA5XX	Audit Course - I

	II Year – II SEMESTER
S.No	Subject
1	Fluid Mechanics & Hydraulic Machines (FM&HM)
2	**Machine Drawing (MD)**
3	Kinematics of Machinery (KOM)
4	Thermal Engineering –I (TE-I)
5	Production Technology (PT)
6	Production Technology Lab (PT Lab)
7	Thermal Engineering Lab(TE Lab)
8	Fluid Mechanics & Hydraulic Machines (FM&HM Lab)

II Year – II SEMESTER		
S.No	Subject Code	Subject
1	A1XXT1XX	Foundation Elective – II
2	A1MET205	Kinematics of Machinery
3	A1MET206	IC Engines and Compressors
4	A1MED207	Machine Drawing
5	A1MET208	Manufacturing Processes
6	A1MET209	Industrial Engineering and Management
7	A1MEL204	Fluid mechanics & Hydraulic machines Laboratory
8	A1MEL205	Production / Metallurgy Laboratory
9	A1EHA5XX	Audit Course – II

III Year – I SEMESTER	
S. No.	Subject
1	Dynamics of Machinery
2	Metal Cutting & Machine Tools
3	Design of Machine Members
4	Instrumentation & Control Systems
5	Thermal Engineering -II
6	Metrology
7	Metrology & Instrumentation Lab
8	Machine Tools Lab
9	IPR & Patents

III Year – I SEMESTER		
S.No	Subject Code	Subject
1	A1MET215	Heat Transfer
2	A1MET216	Design of Machine Members– II
3	A1MET217	Manufacturing Systems
4	A1METXXX	Core Elective – III
5	A1METXXX	Core Elective – IV
6	A1XXT4XX	Open Elective – I
7	A1MEL207	Machine Tools Laboratory
8	A1MEL208	CAD/CAE Laboratory
9	A1EHA5XX	Audit Course – V

III Year – II SEMESTER	
S. No.	Subject
1	Operations Research
2	Interactive Computer Graphics
3	Design of Machine Members
4	Robotics
5	Heat Transfer
6	Industrial Engineering Management
7	Departmental Elective-I
8	Heat Transfer Lab

III Year – II SEMESTER		
S.No	Subject Code	Subject
1	A1MET218	Operations Research
2	A1METXXX	Core Elective – V
3	A1METXXX	Core Elective – VI
4	A1METXXX	Core Elective – VII
5	A1METXXX	Core Elective – VIII (Self-Study)
6	A1XXT4XX	Open Elective – II
7	A1MEL209	Heat Transfer Laboratory
8	A1MEL210	Robotics and CNC Laboratory
9	A1EHA5XX	Audit Course – VI

IV Year – I SEMESTER	
S. No.	**Subject**
1	Automobile Engineering
2	CAD/CAM
3	Finite Element Methods
4	Unconventional Machining Processes
5	Open Elective
6	Departmental Elective – II
7	Simulation Lab
8	Design/Fabrication Project

IV Year – I SEMESTER		
S.No	**Subject Code**	**Subject**
1	A1MET218	Operations Research
2	A1METXXX	Core Elective – V
3	A1METXXX	Core Elective – VI
4	A1METXXX	Core Elective – VII
5	A1METXXX	Core Elective – VIII (Self-Study)
6	A1XXT4XX	Open Elective – II
7	A1MEL209	Heat Transfer Laboratory
8	A1MEL210	Robotics and CNC Laboratory
9	A1EHA5XX	Audit Course – VI

IV Year – II SEMESTER	
S. No.	**Subject**
1	Production Planning and Control
2	Green Engineering Systems
3	Departmental Elective – III
4	Departmental Elective – IV
5	Project Work

IV Year – II SEMESTER		
S.No	**Subject Code**	**Subject**
1	A1MEP601	Directed Study
2	A1MEP602	Major Project

OPEN ELECTIVE:
1. MEMS
2. Nanotechnology
Departmental Elective -I:
1. Refrigeration & Air-conditioning
2. Computational Fluid Dynamics
3. Condition Monitoring
4. Rapid Prototyping

Departmental Elective -II:
1. Material Characterization Techniques
2. Design for Manufacture
3. Automation in Manufacturing
4. Industrial Hydraulics & Pneumatics

Foundation Elective – I & II		
S.No	**Subject Code**	**Subject**
1	A1EHT101	Professional Communication
2	A1EHT102	Business Communication
3	A1MET103	Material Science
4	A1MAT104	Engineering Mathematics II
5	A1PYT105	Electro Magnetic Theory
6	A1CYT106	Instrumental Methods of Analysis
7	A1MET107	Thermodynamics
8	A1CYT108	Applied Analysis
9	A1MAT109	Probability and Statistics
10	A1MAT110	Complex Variables & Statistical Methods
SNo	**Subject Code**	**Core Elective – I**
1	A1MET301	Automobile Engineering
2	A1MET302	Applications of Engineering Mechanics
3	A1MET303	Advanced Materials
4	A1MET304	Total Quality Management

Departmental Elective -III:
1. Experimental Stress Analysis
2. Mechatronics
3. Advanced Materials
4. Power Plant Engineering
Departmental Elective -IV:
1. Non Destructive Evaluation
2. Advanced Optimization Techniques
3. Gas Dynamics & Jet Propulsion
4. Quality and Reliability Engineering

*** Electives opted**

SNo	Subject Code	Core Elective – II
1	A1MET305	Alternate Sources of Energy
2	A1MET306	Advanced Mechanics of Materials
3	A1MET307	Non Destructive Testing
4	A1MET308	Supply chain management
SNo	**Subject Code**	**Core Elective – III**
1	A1MET309	Energy Management
2	A1MET310	Robotics
3	A1MET311	Advanced Machining Processes
4	A1MET312	Industrial Safety
SNo	**Subject Code**	**Core Elective – IV**
1	A1MET313	Refrigeration and Air Conditioning
2	A1MET314	Finite Element Methods
3	A1MET315	Mechatronics
4	A1MET316	Leadership
SNo	**Subject Code**	**Core Elective – V**
1	A1MET317	Power Plant Engineering
2	A1MET318	Mechanical Vibrations and Condition Monitoring
3	A1MET319	Automation in Manufacturing
4	A1MET320	Production Planning and Control
SNo	**Subject Code**	**Core Elective – VI**
1	A1MET321	Computational Fluid Dynamics
2	A1MET322	Creep, Fatigue and Fracture mechanics
3	A1MET323	Product Lifecycle Management
4	A1MET324	Lean Six Sigma
SNo	**Subject Code**	**Core Elective – VII**
1	A1MET325	Engineering in Motion
2	A1MET326	Interactive Computer Graphics
3	A1MET327	Surface Engineering
4	A1MET328	Management Information Systems

SNo	**Subject Code**	**Core Elective – VIII**
1	A1MET329	Waste Heat Recovery and Co-generation
2	A1MET330	Introduction to Nanotechnology
3	A1MET331	Material Characterization Techniques
4	A1MET332	Instrumentation and Metrology
SNo	**Subject Code**	**List of Open Electives**
1	A1MET401	Introduction to Robotics
2	A1MET402	Alternative Fuels and Emissions
3	A1MET403	Production and Operations Management
4	A1MET404	Micro Electrical and Mechanical Systems
5	A1MET405	Product Design
6	A1MET406	Foundation of Computational Fluid Dynamics
Audit Course Electives		
S. No	Subject Code	Subject Name
1	A1ACA501	NSS
2	A1 ACA502	NCC
3	A1 ACA503	Sports
4	A1 ACA504	Cultural
5	A1 ACA505	Yoga
6	A1 ACA506	Health & Nutrition
7	A1 ACA507	Entrepreneurship Development
8	A1 ACA508	Foreign Language (Chinese/Japanese/Korean/German)
9	A1 ACA509	Professional Ethics & IPR
10	A1 ACA510	Soft Skills - I
11	A1 ACA511	Soft Skills - II
12	A1 ACA512	General Aptitude A1ACA512
13		MOOC

B.Tech(ECE)

Change Document from A1 to A2

Department of ECE
MVGR College of Engineering (A)
Mapping of courses of A1 Regulation to A2 Regulation

B.Tech:

A1 Regulation				A2 Regulation			
Semester I				**Semester I**			
S. No	**Subject**	**Credit**	**Remarks**	**S. No**	**Subject**	**Credit**	**Remarks**
1	Engineering Mathematics - I	3	✓	1	Mathematics-I	3	✓
2	Applied Physics	3	✓	2	Applied Physics (Theory + Lab)	5	✓
3	Basics of Civil & Mechanical Engineering	3	-	3	Programming for Problem Solving (Theory + Lab)	5	✓
4	Fundamentals of Electronic Circuits and Devices	3	-	4	Computer Aided Engineering Graphics	3	✓
5	Environmental Studies	3	Is there in III Sem as Audit Course of A2 regulation	5	Constitution of India **Audit course – I**	--	✓
6	English Language Practice -I	2	Is there in II Sem of A2 regulation	6			✓
7	Applied Physics Lab	2	✓	7			✓
8	Basic Engineering Workshop	2	Is there in II Sem of A2 regulation	8			✓
	Total Credits	**21**			**Total Credits**	**16**	

A1 Regulation				A2 Regulation			
Semester II				**Semester II**			
S. No	**Subject**	**Credit**	**Remarks**	**S. No**	**Subject**	**Credit**	**Remarks**
1	Mathematical Methods	3	✓	1	Mathematics-II	3	✓
2	Engineering Drawing	3	-	2	Engineering Chemistry (Theory + Lab)	5	✓
3	Engineering Chemistry	3	✓	3	Basic Electrical Engineering (Theory + Lab)	5	✓
4	Electronic Devices and Circuits	3	✓ Is there in III Sem of A2 regulation	4	Electronics Workshop	2	✓
5	Network Analysis	3	✓ Is there in III Sem of A2 regulation	5	English-I	3	✓
6	English Language Practice -II	2	✓ Is there in IV Sem of A2 regulation	6			✓
7	Engineering Chemistry Lab	2	✓	7			✓
8	Electronic Devices and Circuits Lab	2	✓ Is there in III Sem of A2 regulation	8			✓
9	**Audit course – I** General Aptitude	0	-	9			✓
	Total Credits	**21**			**Total credits**	**18**	

A1 Regulation				A2 Regulation			
Semester III				**Semester III**			
S. No	**Subject**	**Credit**	**Remarks**	**S. No**	**Subject**	**Credit**	**Remarks**
1	Managerial Economics and Financial Analysis	3	Is there in VI Sem of A2 regulation	1	Mathematics-III	3	✓
2	Computer Programming	3	Is there in I Sem of A2 regulation	2	Biology for Engineers	3	✓
3	Electrical Technology	4	Is there in I in II Sem of A2 regulation	3	Electronic Devices & Circuits (Theory + Lab)	4	✓
4	Signals and Systems	4	Is there in IV Sem of A2 regulation	4	Network Theory	3	✓
5	Switching Theory & Logic Design	4	✓	5	Internet of Things (IOT)	3	✓
6	Foundation Elective – I 1. Professional Communication 2. Business Communication 3. Material Science 4. Engineering Mathematics II 5. Electro Magnetic Theory	3	-	6	Switching Theory & Logic Design	3	✓
7	Computer Programming Lab	2	Is there in I Sem of A2 regulation	7	AI Tools, Techniques & Applications	5	✓
8	Electrical Technology & Networks Lab	2	Is there in I in II Sem of A2 regulation	8	Environmental Science **Audit course – II**	--	✓
	Audit course – II Soft Skills - I	0		9			✓
	Total Credits	**25**			**Total credits**	**24**	

A1 Regulation				A2 Regulation			
Semester IV				Semester IV			
S. No	**Subject**	**Credit**	**Remarks**	**S. No**	**Subject**	**Credit**	**Remarks**
1	EM Waves and Transmission Lines	4	Is there in V Sem of A2 regulation	1	Mathematics-IV	3	✓
2	Pulse and Digital Circuits	4	-	2	English-II (Technical English)	3	✓
3	Analog Communications	4	✓	3	Signal and Systems	3	✓
4	Random Variables and Stochastic Process	4	✓	4	Analog Communications (Theory + Lab)	4	✓
5	Switching Theory & Logic Design	4	Is there in III Sem of A2 regulation	5	Random Variable Stochastic Process	3	✓
6	**Core Elective – I** 1. Data Structures 2. Programming with MAT Lab **3. Computer Organization & Architecture**	4	Is there in Professional Elective III in VI Sem of A2 regulation	6	Analog Circuits	3	✓
7	**Foundation Elective – II** 1. Instrumental Methods of Analysis 2. Thermodynamics 3. Applied Analysis 4. Probability and Statistics 5. Complex Variables & Statistical Methods	3	-	7	Design Thinking and Product Innovation	3	✓
8	Analog Communications Lab	2	✓	8	Indian Traditional Knowledge **Audit course – III**	--	✓
	Pulse and Digital Circuits Lab	2	-	9			✓
	Audit course - III Soft Skills - II	0		10			✓
	Total Credits	**31**			**Total credits**	**22**	

A1 Regulation				A2 Regulation			
Semester V				**Semester V**			
S. No	**Subject**	**Credit**	**Remarks**	**S. No**	**Subject**	**Credit**	**Remarks**
1	Control Systems	4	✓	1	Electromagnetic Waves & Transmission Lines (Theory +Lab)	4.5	✓
2	Digital Communications	4	✓	2	Control Systems	3	✓
3	Antennas and Wave Propagation	4	Is there in VI Sem of A2 regulation	3	Digital Communications (Theory + Lab)	4.5	✓
4	Linear and Digital IC Applications	4	-	4	Professional Elective – 1 1. Information Theory and Coding 2. VLSI Design 3. Python Programming	3	✓
5	Microprocessors and Microcontrollers	4	Is there in VI Sem of A2 regulation	5	Open Elective-I 1. Principles of Communication Engineering 2. Microcontrollers and Applications 3. Electronic Instrumentation	3	✓
6	**Core Elective – II** 1. Object Oriented Programming 2. Electronic Circuit Analysis **3. VI Using Lab VIEW**	4	Is there in VII Sem of A2 regulation	6	Open Elective-II 1. Biomedical Engineering 2. Transducers and Sensors 3. Basics of VLSI Design	3	✓
7	Digital Communications Lab	2	✓	7	Socially Relevant Project	1	✓
8	IC Applications Lab	2	-	8			✓
9	**Audit course – IV** Professional Ethics & IPR	0	-	9			✓
	Total Credits	**28**			**Total credits**	**22**	

A1 Regulation				A2 Regulation			
Semester VI				**Semester VI**			
S. No	**Subject**	**Credit**	**Remarks**	**S. No**	**Subject**	**Credit**	**Remarks**
1	Digital Signal Processing	4	✓	1	Antennas & Wave Propagation	3	✓
2	VLSI Design	4	Is there in Professional Elective I in V Sem of A2 regulation	2	Digital Signal Processing (Theory + Lab)	4.5	✓
3	**Core Elective – III** 1. Operating systems **2. Computer Networks** 3. Electronic Switching Systems	3	Is there in Professional Elective III in VI Sem of A2 regulation	3	Microprocessors & Microcontrollers (Theory + Lab)	4.5	✓
4	**Core Elective – IV** 1. Information Theory and Coding 2. Embedded and Real Time Operating Systems **3. Cellular Mobile Communication**	3	Is there in Professional Elective IV in VII Sem of A2 regulation	4	Professional Elective-II 1. Optical Communication 2. Digital IC Design 3. Soft Computing Techniques	3	✓
5	**Core Elective – V** 1. Wireless Sensors & Networks **2. Artificial Intelligence & Neural Networks** **3. Optical Communication**	3	Is there in in III Sem of A2 regulation Is there in Professional Elective II in VI Sem of A2 regulation	5	Professional Elective –III 1. EMI/EMC 2. Computer Architecture & Computer Networks 3. Transform Techniques	3	✓
6	**Open Elective – I** **1. Microcontrollers and Applications** 2. Biomedical Engineering **3.** Electronic Instrumentation	3	Is there in Open Elective I in V Sem of A2 regulation	6	Managerial Economics & Financial Analysis	3	✓
7	Microprocessors and Microcontrollers Lab	2	✓	7	Mini Project	2	✓
8	Digital System Design Lab	2	✓	8			✓
9	**Audit course – V** Entrepreneurship Development	0	-	9			✓
	Total Credits	**24**			**Total credits**	**23**	

A1 Regulation				A2 Regulation			
Semester VII				**Semester VII**			
S. No	**Subject**	**Credit**	**Remarks**	**S. No**	**Subject**	**Credit**	**Remarks**
1	Microwave Engineering	4	✓	1	Microwave Engineering (Theory + Lab)	4	✓
2	Electronic Measurements and Instrumentation	4	Is there in Open Elective I in V Sem of A2 regulation	2	Virtual Instrumentation	3	✓
3	**Core Elective – VI** **1. Radar Systems** 2. Satellite Communication 3. Digital Television	3	Is there in Professional Elective V in VII Sem of A2 regulation	3	Professional Elective-IV 1. Cellular & Mobile Communication 2. Analog IC Design 3. Digital Image & Video Processing	3	✓
4	**Core Elective – VII** **1. Digital Image Processing** 2. RF Circuit Design **3. Biomedical Instrumentation**	3	Is there in Professional Elective IV in VII Sem of A2 regulation Is there in Open Elective II in V Sem of A2 regulation	4	Professional Elective-V 1. Radar & Satellite Systems 2. Embedded & Realtime Operating Systems 3. Biomedical Signal processing	3	✓
5	**Core Elective – VIII** **1. EMI / EMC** **2. Analog IC Design** **3. Digital IC Design**	3	Is there in Professional Elective III, IV, II in VI, VII, VI Sem of A2 regulation	5	Professional Elective-VI 1. Display Systems 2. System On Chip 3. Speech and Audio Processing	3	✓
6	**Open Elective – II** **1. Principles of Communication Engineering** **2. Transducers and Sensors** **3. Basics of VLSI Design**	3	Is there in Open Elective I, II in V Sem of A2 regulation	6	Professional Ethics and Human Values	3	✓

7	Microwave Engineering Lab	2	✓	7	Project Phase - I	2	✓
8	Digital Signal Processing Lab	2	✓	8			✓
	Total Credits	**24**			**Total credits**	**21**	

A1 Regulation				**A2 Regulation**			
Semester VIII				**Semester VIII**			
S. No	**Subject**	**Credit**	**Remarks**	**S. No**	**Subject**	**Credit**	**Remarks**
1	Directed Study & Project	10	Project Phase I, II are there in VII, VIII Sem of A2 regulation	1	Open Elective-III (MOOCS)	3	✓
2	**Audit course - VI** Cultural	0	-	2	Open Elective-IV (MOOCS)	3	✓
3			✓		Project Phase - II	8	
	Total Credits	**10**			**Total credits**	**14**	

1. Integrated courses are introduced in A2 regulation.
2. BCME and FECD subjects were dropped from Sem I of A1 regulation.
3. In A1 regulation 5 Audit courses were changed and 3 new courses Constitution of India,Environment science and Indian traditional knowledge were introduced.
4. In sem IV of A1 regulation, PDC, LDIC,ECA courses were dropped and Analog Circuits is introduced in A2 regulation which is a combination of all 3 courses mentioned.
5. In A1 regulation 180 credits were there and in A2 regulation 160 credits were there as per AICTE norms
6. New courses like IOT, AI, Design thinking were added in A2 curriculum
7. Overall 37 percent variation is there between A1 and A2 regulation where 27 percent variation is due to courses variation and about 10 percent variation is due to internal syllabus change.

B.Tech(CSE)

Board of Studies

A2% Deviation Metric

2019

Main Category	Sub Category	R13				A1			
		Count	Credits	% Mod Dev	% Cre Dev	Count	Credits	% Mod Dev	% Cre Dev
Foundational Theory (Including Electives - 2)									
	Basic Sciences	6	18	-16.667	22.22	5	15	-20	-20
	Humanties	6	18	16.667	22.22	3	9	-100	-100
	Engineering Sciences	2	6	-50	-33.3	4	12	50	50
SUM TOTAL		**14**	**42**	-7.1429	14.29	**12**	**36**	-16.667	-16.7
Foundational Labs									
	Basic Sciences	2	4	0	0	2	4	0	0
	Humanties	2	4	0	0	2	4	0	0
	Engineering Sciences	2	4	-100	-100	2	4	0	0
SUM TOTAL		**6**	**12**	-33.333	-33.3	**6**	**12**	0	0
Core Theory									
	Mandatory	23	69	-13.043	-50.7	18	72	-27.778	4.167
	Electives	4	12	0	-33.3	8	24	50	50
SUM TOTAL		**27**	**81**	-11.111	-48.1	**26**	**96**	-3.8462	15.63
Core Labs									
	Mandatory	17	34	47.059	47.06	10	20	-70	-70
SUM TOTAL		**17**	**34**	47.059	47.06	**10**	**20**	-70	-70
Inter-Departmental (Open Electives)									
	Electives	0	0			2	6	100	100
SUM TOTAL		**0**	**0**			**2**	**6**	100	100
Audits		2	0	-100		6	0	66.667	
Seminar		2	2			0	0		
Project		1	9	0	-33.3	1	10	0	10
WHOLE TOTAL		**69**	**180**	-1.4493	-15.6	**63**	**180**	-9.5238	0

B.Tech(Chemical)

Board of Studies
A1% Deviation Metric
2015

Main Category	Sub Category	A1				A2			
		Count	Credits	% Mod Dev	% Cre Dev	Count	Credits	% Mod Dev	% Cre Dev
Foundational Theory (Including Electives - 2)									
	Basic Sciences	5	15	-20	-20	7	21	28.571	28.57
	Humanties	3	9	-100	-100	4	11	25	18.18
	Engineering Sciences	4	12	50	50	5	15	20	20
SUM TOTAL		**12**	**36**	-16.667	-16.7	**16**	**47**	25	23.4
Foundational Labs									
	Basic Sciences	2	4	0	0	2	4	0	0
	Humanties	2	4	0	0	1	1	-100	-300
	Engineering Sciences	2	4	0	0	5	11	60	63.64
SUM TOTAL		**6**	**12**	0	0	**8**	**16**	25	25
Core Theory									
	Mandatory	18	72	-27.778	4.167	14	42	-28.571	-71.4
	Electives	8	24	50	50	6	18	-33.333	-33.3
SUM TOTAL		**26**	**96**	-3.8462	15.63	**20**	**60**	-30	-60
Core Labs									
	Mandatory	10	20	-70	-70	7	12	-42.857	-66.7
SUM TOTAL		**10**	**20**	-70	-70	**7**	**12**	-42.857	-66.7
Inter-Departmental (Open Electives)									
	Electives	2	6	100	100	4	12	50	50
SUM TOTAL		**2**	**6**	100	100	**4**	**12**	50	50
Audits		6	0	66.667		2	0	-200	
Seminar		0	0			0	0		
Project		1	10	0	10	4	13	75	23.08
WHOLE TOTAL		**63**	**180**	-9.5238	0	**61**	**160**	-3.2787	-12.5

DEPARTMENT OF CHEMICAL ENGINEERING
MVGR COLLEGE OF ENGINEERING: VIZIANAGARAM (A)
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A1 REGULATIONS COURSE STRUCTURE

I SEMESTER:

S.No	Course code	Theory/Lab	L	T	P	C
1	A1MAT001	Engineering Mathematics-I	3	0	0	3
2	A1CYT002	Chemistry for Chemical Engineers	3	0	0	3
3	A1CIT001	Computer programming	3	0	0	3
4	A1CET001	Basics of Civil & Mechanical Engineering	3	0	0	3
5	A1CHT002	Introduction to Chemical Engineering	3	0	0	3
6	A1EHL001	English Language Practice –I	1	0	2	2
7	A1CYL001	Engineering Chemistry lab	0	0	3	2
8	A1CIL001	Computer programming Lab	0	0	3	2
		Total				**21**

II SEMESTER:

S.No	Course code	Theory/Lab	L	T	P	C
1	A1MAT002	Mathematical Methods	3	0	0	3
2	A1CHT001	Environmental Studies	3	0	0	3
3	A1PYT001	Engineering Physics	3	0	0	3
4	A1EET001	Basic Electrical and Electronics Engineering	3	0	0	3
5	A1MED001	Engineering. Drawing	3	0	0	3
6	A1EHL002	English Language Practice –II	1	0	2	2
7	A1PYL001	Engineering Physics Lab	0	0	3	2
8	A1MEW001	Basic Engineering Workshop	0	0	3	2
		Total				**21**

III SEMESTER:

S.No	Subject Code	Subject	L	T	P	C
1	A1CHT201	Material Science for Chemical Engineers	4	0	0	4
2	A1CHT202	Chemical Process Calculations	3	1	0	4
3	A1CHT203	Fluid Mechanics for Chemical Engineers	3	1	0	4
4	A1CHT204	Chemical Technology	4	0	0	4
5	A1CYT205	Organic Chemistry	4	0	0	4
6	A1XXT1XX	Foundation Elective-I	3	0	0	3
7	A1CHL201	Fluid Mechanics Lab for Chemical Engineers	0	0	3	2
8	A1CHL202	Chemical Technology Lab	0	0	3	2
9	A1EHA5XX	Audit Course-1	-	-	-	-
		Total				**27**

IV SEMESTER:

S.No	Subject Code	Subject	L	T	P	C
1	A1CHT206	Process Heat Transfer	3	1	0	4
2	A1CHT207	Chemical Engineering Thermodynamics-I	3	1	0	4
3	A1CHT208	Mechanical Unit Operations	3	1	0	4
4	A1CHT3XX	Core elective -I	3	0	0	3
5	A1XXT1XX	Foundation Elective-II	3	0	0	3
6	A1CHL203	Process Heat Transfer Lab	0	0	3	2

7	A1CHL204	Mechanical unit operations Lab	0	0	3	2
8	A1EHA5XX	Audit Course-2	-	-	-	
		Total				**22**

V SEMESTER:

S.No	Subject Code	Subject	L	T	P	C
1	A1CHT209	Process Instrumentation	3	0	0	3
2	A1CHT210	Chem. Engineering Thermodynamics-II	3	1	0	4
3	A1CHT211	Chemical Reaction Engineering-I	3	1	0	4
4	A1CHT212	Mass Transfer Operations-I	3	1	0	4
5	A1CHT3XX	Core Elective-II	3	0	0	3
6	A1CHT3XX	Core Elective-III	3	0	0	3
7	A1CHL205	Chemical Reaction Engineering. Lab	0	0	3	2
8	A1CHL206	Mass Transfer Operations Lab	0	0	3	2
9	A1EHA5XX	Audit Course - 3	-	-	-	-
10	A1EHA5XX	Audit Course - 4	-	-	-	-
		Total				**25**

VI SEMESTER:

S.No	Subject Code	Subject	L	T	P	C
1	A1CHT213	Mass Transfer Operations-II	3	1	0	4
2	A1CHT214	Process Dynamics & Control	3	1	0	4
3	A1CHT215	Chemical Reaction Engineering -II	3	1	0	4
4	A1CHT216	Process Modeling & Simulation	3	1	0	4
5	A1CHT3XX	Core Elective-IV	3	0	0	3
6	A1CHL207	Process Dynamics & Control Lab	0	0	3	2
7	A1CHL208	Process Modeling and Simulation lab using MATLAB	0	0	3	2
8	A1XXT4XX	Open Elective –I	3	0	0	3
9	A1EHA5XX	Audit Course - 5	-	-	-	-
		Total				
						26

VII SEMESTER:

S.No	Subject Code	Subject	L	T	P	C
1	A1MST001	Managerial Economics & Financial Analysis	3	0	0	3
2	A1CHT217	Transport Phenomena	3	1	0	4
3	A1CHT218	Plant Design & Economics for Chemical Engineers	3	1	0	4
4	A1CHT3XX	Core Elective – V	3	0	0	3
5	A1CHT3XX	Core Elective – VI	3	0	0	3
6	A1CHT3XX	Core Elective – VII	3	0	0	3
7	A1XXT4XX	Open Elective-II	3	0	0	3
8	A1CHD201	Process Equipment Design & Drawing using AutoCAD	0	0	3	2
9	A1EHA5XX	Audit Course-6	-	-	-	-
		Total				
						25

VIII SEMESTER:

S.No	Subject Code	Subject	L	T	P	C
1	A1CHT3XX	Core Elective – VIII (Self-study)	3	0	0	3
2	A1CHP601	Directed Study	0	0	0	2
3	A1CHP602	Project Work	0	0	0	8
		Total				
						13

Open Elective-I offered by Chemical Engineering Department to other Departments		
S.No	**Subject Code**	**Subject Name**
1	A1CHT401	Non-Conventional Sources of Energy
2	A1CHT402	Design & Analysis of Experiments
3	A1CHT403	Industrial Pollution Control & Engineering

Open Elective-II offered by Chemical Engineering Department to other Departments		
S.No	**Subject Code**	**Subject Name**
1	A1CHT404	Energy Engineering
2	A1CHT405	Green Chemistry & Technology
3	A1CHT406	Environmental Impact Assessment

Core Elective-I		
S.No	**Subject Code**	**Subject Name**
1	A1CHT301	Fertilizer Technology
2	A1CHT302	Petroleum Refining
3	A1CHT303	Polymer Technology

Core Elective-II		
S.No	**Subject Code**	**Subject Name**
1	A1CHT304	Paper Technology
2	A1CHT305	Fuel Cell Technology
3	A1CHT306	Industrial Pollution Control & Engineering

Core Elective-III		
S.No	**Subject Code**	**Subject Name**
1	A1CHT307	Ceramic Technology
2	A1CHT308	Petro Chemical Technology
3	A1CHT309	Nano Technology

Core Elective-IV		
S.No	**Subject Code**	**Subject Name**
1	A1CHT310	Food Technology
2	A1CHT311	Mineral Process Engineering
3	A1CHT312	Technology of Pharmaceuticals & Fine Chemicals

Core Elective-V		
S.No	**Subject Code**	**Subject Name**
1	A1CHT313	Bio Chemical Engineering
2	A1CHT314	Project Management
3	A1CHT315	Process Intensification

Core Elective-VI		
S.No	**Subject Code**	**Subject Name**
1	A1CHT316	Industrial Bio Technology
2	A1CHT317	Corrosion & Control
3	A1CHT318	Optimization of Chemical Processes

Core Elective-VII		
S.No	**Subject Code**	**Subject Name**
1	A1CHT319	Fermentation Engineering
2	A1CHT320	Nuclear Reactor Engineering
3	A1CHT321	Industrial Safety & Hazard Management

Core Elective-VIII		
S.No	**Subject Code**	**Subject Name**
1	A1CHT322	Statistical Molecular Thermodynamics
2	A1CHT323	Organic Solar Cells
3	A1CHT324	Bio Electricity

Foundation Electives		
S.No	**Subject Code**	**Subject Name**
1	A1EHT101	Professional Communication
2	A1EHT102	Business Communication
3	A1PYT103	Material Science
4	A1MAT104	Engineering Mathematics-II
5	A1PYT105	Electromagnetic Theory
6	A1CYT106	Instrumental Methods of Analysis
7	A1MET107	Thermodynamics
8	A1CYT108	Applied Analysis
9	A1MAT109	Probability & Statistics
10	A1MAT110	Complex Variables & Statistical Methods

Audit Course Electives		
S.No	**Subject Code**	**Subject Name**
1	A1ACA501	NSS
2	A1ACA502	NCC
3	A1ACA503	Sports
4	A1ACA504	Cultural
5	A1ACA505	Yoga
6	A1ACA506	Health & Nutrition
7	A1ACA507	Entrepreneurship Development
8	A1ACA508	Foreign Language (Chinese / Japanese/ Korean/ German)
9	A1ACA509	Professional Ethics & IPR
10	A1ACA510	Soft Skills –I
11	A1ACA511	Soft Skills -II
12	A1ACA512	General Aptitude
13		MOOC

DEPARTMENT OF CHEMICAL ENGINEERING
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A2 REGULATIONS COURSE STRUCTURE

I SEMESTER:

S.No	Course code	Theory/Lab	L	T	P	C
1	A2MAT101	Mathematics-I	3	-	-	3
2	A2PYI101	Engineering Physics (Theory + Lab)	3	-	3	5
3	A2CII201	Programming for Problem Solving (Theory + Lab)	3	-	3	5
4	A2MED201	Computer Aided Engineering Graphics	1	-	3	3
5	A2EHA701	Constitution of India	2	-	-	-
		Total				**16**

II SEMESTER:

S.No	Course code	Theory/Lab	L	T	P	C
1	A2EHL001	English-I	1	-	3	3
2	A2MAT102	Mathematics-II	3	-	-	3
3	A2CYI101	Engineering Chemistry (Theory + Lab)	3	-	3	5
4	A2EEI201	Basic Electrical Engineering (Theory + Lab)	3	-	3	5
5	A2CHW201	Workshop (Chemical Engineering)	-	-	3	2
		Total				**18**

III SEMESTER:

S.No	Subject Code	Subject	L	T	P	C
1	A2MAT103	Mathematics-III	3	-	-	3
2	A2CHT101	Biology for Engineers	3	-	-	3
3	A2MET202	Design thinking and Product Innovation	3	-	-	3
4	A2CII201	AI Tools, Techniques & Applications	3	-	3	5
5	A2CHT301	Chemical Technology	3	-	-	3
6	A2CHT302	Fluid Mechanics for Chemical Engineers	3	-	-	3
7	A2CHL301	Fluid Mechanics Lab	-	-	3	1.5
8	A2CHL302	AutoCAD Lab	-	-	3	1.5
9	A2EHA702	Indian Traditional Knowledge	2	-	-	-
		Total				**23**

IV SEMESTER:

S.No	Subject Code	Subject	L	T	P	C
1	A2MAT104	Mathematics-IV	3	-	-	3
2	A2EHT002	English-II	2	-	2	3
3	A2CIT202	Internet of Things	3	-	-	3
4	A2CHT303	Chemical Process Calculations	3	-	-	3
5	A2CHT304	Mechanical Unit Operations	3	-	-	3
6	A2CHT305	Process Heat Transfer	3	-	-	3
7	A2CHL303	Mechanical Unit Operations Lab	-	-	3	1.5
8	A2CHL304	Process Heat Transfer Lab	-	-	3	1.5

9	A2CHP601	Mini Project / Internship	-	-	4	2
10	A2CHA703	Environmental Science	2	-	-	-
		Total				**23**

V SEMESTER:

S.No	Subject Code	Subject	L	T	P	C
1	A2CHT306	Chemical Engg. Thermodynamics	3	-	-	3
2	A2CHT307	Chemical Reaction Engineering - I	3	-	-	3
3	A2CHT308	Mass Transfer - I	3	-	-	3
4	A2CHT4XX	Professional Elective-1	3	-	-	3
5	A2CHT5XX	Open Elective -1	3	-	-	3
6	A2CHT5XX	Open Elective -2	3	-	-	3
7	A2CHL305	Chemical Reaction Engineering Lab	-	-	3	1.5
8	A2CHL306	Mass Transfer Lab	-	-	3	1.5
		Total				**21**

VI SEMESTER:

S.No	Subject Code	Subject	L	T	P	C
1	A2CHT309	Chemical Reaction Engineering - II	3	-	-	3
2	A2CHT310	Mass Transfer - II	3	-	-	3
3	A2CHT311	Process Instrumentation & Control	3	-	-	3
4	A2CHT312	Process Modeling & Simulation	3	-	-	3
5	A2CHT4XX	Professional Elective-2	3	-	-	3
6	A2CHT5XX	Open Elective -3	3	-	-	3
7	A2EHT003	MEFA	3	-	-	3
8	A2CHL307	Process Instrumentation & Control Lab	-	-	3	1.5
9	A2CHL308	Process Modeling & Simulation Lab	-	-	3	1.5
		Total				**24**

VII SEMESTER:

S.No	Subject Code	Subject	L	T	P	C
1	A2CHT313	Chemical Process Equipment Design & Economics	3	-	-	3
2	A2CHT314	Transport Phenomena	3	-	-	3
3	A2CHT5XX	Open Elective -4	3	-	-	3
4	A2CHT4XX	Professional Elective-3	3	-	-	3
5	A2CHT4XX	Professional Elective-4	3	-	-	3
6	A2EHT004	Professional Ethics and Human Values	3	-	-	3
7	A2CHP602	Socially Relevant Project	-	-	2	1
8	A2CHP603	Project -I (Phase-I)	-	-	4	2
		Total				**21**

VIII SEMESTER:

S.No	Subject Code	Subject	L	T	P	C
1	A2CHT4XX	Professional Elective-5	3	-	-	3
2	A2CHT4XX	Professional Elective-6	3	-	-	3
3	A2CHP604	Project-II (Phase-II)	-	-	16	8
		Total				**14**

Open Elective-I offered by Chemical Engineering Department to other Departments		
S.No	**Subject Code**	**Subject Name**
1	A2CHT501	Industrial Pollution Control & Engineering
2	A2CHT502	Renewable Energy Resources
3	A2CHT503	Solid Waste Management
Open Elective-II offered by Chemical Engineering Department to other Departments		
S.No	**Subject Code**	**Subject Name**
1	A2CHT504	Energy Engineering
2	A2CHT505	Green Chemistry & Technology
3	A2CHT506	Air Pollution Control and Design of Equipment
Open Elective-III offered by Chemical Engineering Department to other Departments		
S.No	**Subject Code**	**Subject Name**
1	A2CHT507	Industrial Waste Water Engineering
2	A2CHT508	Environmental Impact Assessment
3	A2CHT509	Computational Fluid Dynamics
Open Elective-IV offered by Chemical Engineering Department to other Departments		
S.No	**Subject Code**	**Subject Name**
1	A2CHT510	Bio Energy
2	A2CHT511	Energy Conservation and Management
3	A2CHT512	Design & Analysis of Experiments
Professional Elective-I		
S.No	**Subject Code**	**Subject Name**
1	A2CHT401	New Material Technology
2	A2CHT402	Fertilizer Technology
3	A2CHT403	Polymer Technology
Professional Elective-II		
S.No	**Subject Code**	**Subject Name**
1	A2CHT404	Petroleum Refining
2	A2CHT405	Petro Chemical Technology
3	A2CHT406	Fuel Cell Technology
Professional Elective-III		
S.No	**Subject Code**	**Subject Name**
1	A2CHT407	Phase & Reaction Equilibria
2	A2CHT408	Corrosion & Control
3	A2CHT409	Process Intensification
Professional Elective-IV		
S.No	**Subject Code**	**Subject Name**
1	A2CHT410	Food Processing Technology
2	A2CHT411	Nano Technology

B.Tech(IT)

3	A2CHT412	Pharmaceutical Technology
Professional Elective-V		
S.No	**Subject Code**	**Subject Name**
1	A2CHT413	Bio Chemical Engineering
2	A2CHT414	Enzyme Engineering
3	A2CHT415	Nuclear Reactor Engineering
Professional Elective-VI		
S.No	**Subject Code**	**Subject Name**
1	A2CHT416	Industrial Bio Technology
2	A2CHT417	Industrial Safety & Hazard Management
3	A2CHT418	Optimization of Chemical Processes

BOS A2 % Deviation Metric

Main Category	Sub Category	A1				A2			
		Count	Credits	% Mod Dev	% Cre Dev	Count	Credits	% Mod Dev	% Cre Dev
Foundational Theory (Including Electives - 2)									
	Basic Sciences	5	15	-20	-20	7	21	28.571	28.57
	Humanties	3	9	-100	-100	4	11	25	18.18
	Engineering Sciences	4	12	50	50	5	15	20	20
SUM TOTAL		**12**	**36**	-16.667	-16.7	**16**	**47**	25	23.4
Foundational Labs									
	Basic Sciences	2	4	0	0	2	4	0	0
	Humanties	2	4	0	0	1	1	-100	-300
	Engineering Sciences	2	4	0	0	5	11	60	63.64
SUM TOTAL		**6**	**12**	0	0	**8**	**16**	25	25
Core Theory									
	Mandatory	18	72	-27.778	4.167	14	42	-28.571	-71.4
	Electives	8	24	50	50	6	18	-33.333	-33.3
SUM TOTAL		**26**	**96**	-3.8462	15.63	**20**	**60**	-30	-60
Core Labs									
	Mandatory	10	20	-70	-70	7	12	-42.857	-66.7
SUM TOTAL		**10**	**20**	-70	-70	**7**	**12**	-42.857	-66.7
Inter-Departmental (Open Electives)									
	Electives	2	6	100	100	4	12	50	50
SUM TOTAL		**2**	**6**	100	100	**4**	**12**	50	50
Audits		6	0	66.667		2	0	-200	
Seminar		0	0			0	0		
Project		1	10	0	10	4	13	75	23.08
WHOLE TOTAL		**63**	**180**	-9.5238	0	**61**	**160**	-3.2787	-12.5

2. FROM A2 TO A1 FOR APPLIED PHYSICS COURSE

- The Applied Physics course of the A2 regulation, MVGR is single semester course and is common across the EEE, ECE, CSE & IT disciplines. The course is offered since the AY: 2019-20.
- The Applied Physics is offered as an integrated course in the A2 regulation, which is different from the foregoing course of the A1 regulation based on their evaluation procedures.
- To meet the contemporary program requirements for the EEE and ECE engineering disciplines, a new module/unit covering fundamental concepts of **Heat Transfer** in the place of **Laser & Fiber optics** of the A1 regulation.
- Taking into account of the newly introduced A2 academic regulations of MVGR, the Applied Physics course comprise 5 Units/Modules compared to the earlier 6 Unit course of the A1 regulation.
- The newly introduced Applied Physics course of the A2 regulation deviates nearly by about **25%** in comparison with the earlier A1 regulation.
- Concerning the Applied Physics Lab, a total of **10 experiments** was introduced which are in well mapping with the course content delivered in the classroom.
- The experiments chosen focus on the vital concepts/topics of each unit and covering all the units of the course taught in classroom.

1. FROM A2 TO A1 FOR ENGINEERING PHYSICS COURSE

- The Engineering Physics course of the A2 regulation, MVGR is single semester course and is common across the CIV, MEC & CHE disciplines. The course is offered since the AY: 2019-20.
- The Engineering Physics is offered as an integrated course in the A2 regulation, which is different from the foregoing course of the A1 regulation based on their evaluation procedures.
- To meet the contemporary program requirements for the CIV, MEC & CHE engineering disciplines, a new module/unit covering fundamental concepts of **Ultrasonics & Acoustics** in the place of (i) **Wave optics** and (ii) **Magnetic and dielectric properties of materials** of the A1 regulation.
- Taking into account of the newly introduced A2 academic regulations of MVGR, the Engineering Physics course comprise 5 Units/Modules compared to the earlier 6 Unit course of the A1 regulation.
- The newly introduced Engineering Physics course of the A2 regulation deviates nearly by about **25%** in comparison with the earlier A1 regulation.
- Concerning the Engineering Physics Lab, a total of **10 experiments** was introduced which are in well mapping with the course content delivered in the classroom.
- The experiments chosen focus on the vital concepts/topics of each unit and covering all the units of the course taught in classroom.

suggested eliminating the experiment on determination of moisture content in coal. The suggestion was taken.

6. Chairman BOS presented the proposed syllabus of Open electives offered by the department, to the members. The members resolved to adopt the syllabus as it is.
7. Dr. Ch.V. Subbarao, HOD- Chemical Engineering requested to confine the syllabus of Organic Chemistry (open elective) to FIVE units. The suggestion was well taken.
8. After the discussion, the chairman thanked all the members for their active participation in the deliberations and the meeting is adjourned.

Head of the Department
Department of Chemistry
MVGR College of Engineering (A)
Vizianagaram.

The members on the BOS discussed the agenda and the following suggestions were given.

1. Chairman-BOS presented the model curriculum proposed by AICTE for B.Tech programs. The members of the board while appreciating the initiative of AICTE opined that the syllabus proposed by AICTE requires some fine tuning as it is different from the existing University(JNTUK) and Autonomous (MVGR-A1regulation) syllabi.
2. Chairman-BOS has presented the syllabus proposed by APSCHE in the meeting, wherein the two Chemistry courses were proposed. One for circuit branches (ECE, IT, CSE and EEE) and other for non-circuit branches (MECH, CIVIL& AERO). APSCHE has not specified any syllabus for CHEM branch.
3. Based on the inputs given by BOS-Chairman's of program departments on the proposed syllabi by AICTE and APSCHE, the members of the Department of Chemistry has arrived at proposing a syllabus for the course Engineering Chemistry. This proposed syllabus is designed to cater all branches of engineering. The proposed course comprises of FIVE chapters only and is as per the structure proposed by AICTE & APSCHE.
4. Chairman-BOS presented the proposed syllabus for Engineering Chemistry course under A2 regulation to the members on the board. The members have given the following suggestions and were incorporated.
   a. Dr. NVSS Raman, Sr. Vice President, Hetero Drugs Pvt Ltd., suggested incorporating an introduction to chromatographic techniques and details on ion chromatography and its application in water softening in Unit- IV.
   b. Dr. N. Annapurna, Associate professor, Andhra University suggested to discuss all the boiler troubles encountered during its usage for industries, in Unit-I.
   c. The members suggested incorporating Decay of cement into Unit-V
   d. Chairman of BOS- Department of Mechanical Engineering requested to incorporate CVD (chemical vapor deposition) technique and properties of nanomaterials in Unit-V. This request has been placed in the board and the members have agreed to do so.

M.Tech(Structural Engg)

DEPARTMENT OF CIVIL ENGINEERING

MVGR College of Engineering (Autonomous)

Accredited by NBA, NAAC with 'A' Grade of UGC, Approved by AICTE, New Delhi
Permanently Affiliated to JNTU, Kakinada, Listed U/S 2(f) & 12(B) of the UGC Act 1956
Vijayaram Nagar Campus, Chintalavalasa, Vizianagaram-535 005

Change document for Structural Engineering Curriculum
from A1 Regulation to A2 Regulation

MTech Structural Engineering

M.Tech. I Semester

A1 Regulation			A2 Regulation		
S.No.	**Course**	**Credits**	**S.No.**	**Course**	**Credits**
1	Advanced Mathematics	4	1	Advanced Structural Analysis	3
2	Theory of Elasticity	4	2	Advanced Solid Mechanics	3
3	Advanced Reinforced Concrete	4	3	**Program Elective - I** Advanced Reinforced Concrete Structures Theory and Applications of Cement Composites Theory of Structural Stability	3
4	Structural Dynamics and Earthquake Resistant Design	4	4	**Program Elective - II** a) Analytical and Numerical Methods for Structural Engineering b) Structural Health Monitoring c) Structural Optimization	3
5	**Elective –I** Advanced Structural Analysis Industrial Structures Advanced Concrete Technology	3	5	Structural Design Lab	2
6	**Elective – II** Design of Tall Structures Disaster Management Theory of Plates and Shells	3	6	Advanced Concrete Lab	2
7	Advanced Structural Engineering lab	2	7	Research Methodology and IPR	2
Total Credits		**24**	8	**Audit Course-I**	0
			Total Credits		**18**

-	**Audit Courses for A2 Regulation** Constitution of India Disaster Management English for Research Paper Writing Pedagogy Studies Personality Development through Life Enlightenment Skills Sanskrit for Technical Knowledge Stress Management by Yoga Value Education

M.Tech. II Semester

A1 Regulation			**A2 Regulation**		
S.No.	**Course**	**Credits**	**S.No.**	**Course**	**Credits**
1	Substructure Design	4	1	FEM in Structural Engineering	3
2	Finite Element method	4	2	Structural Dynamics	3
3	Stability of Structures	4	3	**Program Elective - III** Advanced Steel Design Design of High Rise Structures Design of Masonry Structures	3
4	Prestressed Concrete	4	4	**Program Elective - IV** Design of Advanced Concrete Structures Advance Design of Foundation Design of Industrial Structures	3
5	**Elective –III** Structural Optimization Bridge Engineering Repair and Rehabilitation of Structures	3	5	FEM Laboratory (ANSYS)	2
6	**Elective – IV** Structural Reliability Design of Hydraulic Structures Plastic analysis and Design of Steel Structures	3	6	Numerical Analysis Laboratory	2
7	Computer Applications in Structural Engineering Laboratory	2	7	Mini Project	2
Total Credits		**24**	8	**Audit Course-II**	0
			Total Credits		**18**

M.Tech. III Semester

A1 Regulation			A2 Regulation		
S.No.	**Course**	**Credits**	**S.No.**	**Course**	**Credits**
1	Research Methodologies	2	1	**Program Elective - V** Design of Pre-stressed Concrete Structures Mechanics of Composite Materials Fracture Mechanics	3
2	Comprehensive Viva	2	2	**Open Elective** Business Analytics Composite Materials Cost Management of Engineering Projects Industrial Safety Operations Research Waste to Energy	3
3	Pre-requisite Study	2	3	Dissertation Phase-I	10
4	Seminar	2	**Total Credits**		**16**
5	Project Phase - I	8			
Total Credits		**16**			

M.Tech. IV Semester

A1 Regulation			A2 Regulation		
S.No.	**Course**	**Credits**	**S.No.**	**Course**	**Credits**
1	Project Phase - II	16	1	Dissertation Phase-II	16
Total Credits		**16**	**Total Credits**		**16**

Changes in A2 Regulation in comparison with A1 regulation:

- In A1 Regulation, for I semester and II semester total number of credits per semester is 24 credits and for III semester and IV semester, the total number of credits per semester is 16 credits. In A2 regulation, for I semester and II semester total number of credits per semester are 18 credits and III semester total number of credits is 26 and IV semester total number of credits are 16 credits. This is essentially done to implement the model AICTE curriculum in true spirit.
- In A1 regulation, Project phase I is carried out in III semester for which 8 credits are allotted and in IV semester, for Project Phase-II is carried out and 16 credits are allotted for it. Hence, the total credits for Project work is 24 credits. Now in A2 regulation, Dissertation Phase-I is carried out in III semester for which 10 credits are allotted and Phase-II is carried out in IV semester for which 16 credits are allotted. A total of 26 credits are allotted for Dissertation / Project work in A2 regulation.
- In A1 regulation, Mandatory courses have 4 credits and Elective courses have 3 credits and laboratory courses have 2 credits. Now, in A2 regulation, theory courses are allotted with 3 credits and Laboratory courses are allotted with 2 credits as per AICTE model curriculum.
- In A2 regulation two audit courses are included, one audit course is in I semester and second audit course is in II semester.

- An Open elective course is newly included in III semester of A2 regulation and Comprehensive viva voce, seminar and pre-requisite study courses are excluded in A2 regulation.
- Research methodology course in A1 regulation is renamed as “Research Methodology and IPR” in A2 regulation and is running in I semester.
- In place of “Advanced structural engineering Laboratory” in I semester of A1 regulation, two laboratories “Structural Design Laboratory” and “Advanced Concrete Laboratory” are introduced in I semester of A2 Regulation.
- Further, “FEM Laboratory” and “Numerical Analysis Laboratory” are included in II semester of A2 regulation.
- Theory of Elasticity course is renamed as “Advanced Solid Mechanics” in A2 regulation.
- Advanced Mathematics course is renamed as “Analytical and Numerical Methods for Structural Engineering” and is offered as Program elective in A2 regulation.
- Substructure Design course is renamed as “Advanced foundation design” in A2 regulation.
- Structural Dynamics and Earthquake Resistant Design course is opted out and Structural Dynamics course is included in A2 regulation.
- Stability of structures course is excluded in A2 regulation.
- In A2 regulations the total number of credits is 68 whereas in A1 regulations the total number of credits was 80.

M.Tech(Power Systems)

Course details under Autonomous (A1) Regulation		Percentage of Syllabus content added or replaced	Course details under Autonomous (A2) Regulation	
Course code	**Name of the Course**		**Course code**	**Name of the Course**
A1PST102	HVDC Transmission	Removed	---	---
A1PST101	Power System Operation and Control	Removed	---	---
A1PST104	Renewable Energy Sources	60% replaced	A2PST102	Renewable Energy Systems
A1PST203	Modern Control Systems	5% replaced	A2PST205	Advanced Control Systems
A1PST209	Advanced Power System Protection	Removed	---	---
A1PST108	Smart Grid	5% replaced	A2PST201	Smart grid
AIPST107	Power Quality	40% replaced	A2PST214	Power Quality
A1PST210	Power System Planning and Reliability	Removed	---	---
A1PST206	Power System restructuring & Deregulation	60% replaced	A2PST208	Restructured Power Systems
A1PST212	High Voltage Testing Techniques	Removed	---	---
A1PST211	Power System transients	Removed	---	---
A1PSL101	Power Systems Laboratory	20% replaced	A2PSL101	Power Systems Lab
A1PSS501	Seminar	Removed	---	---
A1PST103	Modeling & Simulation of Power Electronic Systems	Removed	---	---
A1PST202	Digital Signal Processing	Removed	---	---
A1PST207	Distribution Automation	Removed	---	---
A1PST109	Research Methodologies	60% replaced	A2PST105	Research Methodology & IPR
A1PSV401	Comprehensive Viva	Removed	---	---
A1PSR401	Pre-requisite Study	Removed	---	---
A1PST201	Embedded Systems	40% replaced	A2PST212	Advanced Micro-Controller Based Systems
---	---	Introduced	A2PST101	Power System Analysis
---	---	Introduced	A2PST209	Advanced Digital Signal Processing
---	---	Introduced	A2PST202	High Power Converters
---	---	Introduced	A2PST203	Optimal Control Theory
---	---	Introduced	A2PST204	Electrical Power Distribution System

---	---	Introduced	A2PST206	Pulse Width Modulation for PE Converters
---	---	Introduced	A2PST207	Electric and Hybrid Vehicles
---	---	Introduced	A2PSL102	Renewable Energy Lab
---	---	Introduced	A2PST103	Digital Protection of Power System
---	---	Introduced	A2PST210	Dynamics of Electrical Machines
---	---	Introduced	A2PST211	Power Apparatus Design
---	---	Introduced	A2PST213	SCADA System and Applications
---	---	Introduced	A2PSP401	Mini Project with Seminar
---	---	Introduced	A2PSL103	Power System Protection Lab
---	---	Introduced	A2PSL104	Power Electronic Applications to Power Systems Lab
---	---	Introduced	A2PST216	Distributed Generation
---	---	Introduced	A2PST218	Industrial Load Modelling and Control
---	---	Introduced	A2PST219	Dynamics of Linear Systems
---	---	Introduced	A2OET301	Business Analytics
---	---	Introduced	A2OET302	Composite Materials
---	---	Introduced	A2OET303	Cost Management of Engineering Projects
---	---	Introduced	A2OET304	Industrial Safety
---	---	Introduced	A2OET305	Operations Research
---	---	Introduced	A2OET306	Waste to Energy
---	---	Introduced	A2ACA501	Constitution of India
---	---	Introduced	A2ACA502	Disaster Management
---	---	Introduced	A2ACA503	English for Research Paper Writing
---	---	Introduced	A2ACA504	Pedagogy Studies
---	---	Introduced	A2ACA505	Personality Development through Life Enlightenment Skills
---	---	Introduced	A2ACA506	Sanskrit for Technical Knowledge
---	---	Introduced	A2ACA507	Stress Management by Yoga

M.Tech (PDM)

A1PDM Course structure

I-Semester

1	A1PDT101	Product Design
2	A1PDT102	Computer Aided Design
3	A1PDT103	Materials and Processes Selection
4	A1PDT104	Advanced Manufacturing Technology
5	A1PDT2XX	Elective-I
6	A1PDT2XX	Elective-II
7	A1PDL101	Advanced Manufacturing Laboratory
	Elective - I	
1	A1PDT201	**Project Management**
2	A1PDT202	Quality and reliability engineering
3	A1PDT203	Industrial design and ergonomics
	Elective - II	
1	A1PDT204	Mechatronics and Robotics
2	A1PDT205	Lean and agile manufacturing
3	A1PDT206	**Flexible Manufacturing Systems**

II-Semester

S.NO.	Subject Code	Subject
1	A1PDT105	Design for Manufacturing and Assembly
2	A1PDT106	Computer Aided Manufacturing
3	A1PDT107	Digital Manufacturing
4	A1PDT108	Product Life Cycle Management
5	A1PDT2XX	Elective III
6	A1PDT2XX	Elective IV
7	A1PDL102	CAE Laboratory
	Elective - III	
1	A1PDT207	Advanced machine design
2	A1PDT208	Finite element analysis
3	A1PDT209	**Computational Fluid Dynamics**
	Elective - IV	
1	A1PDT210	Surface Processing Techniques
2	A1PDT211	**Six Sigma**
3	A1PDT212	Non-traditional machining processes

III-Semester

S. No	Subject Code	Subject
1	A1PDT109	Research Methodologies
2	A1PDV401	Comprehensive Viva-Voce
3	A1PDR401	Self-Study (Pre-requisite)
4	A1PDS501	Seminar
5	A1PDP501	Project Phase - I

IV SEMESTER

S.No	Subject Code	Subject
1	A1PDP502	Project Phase – II

A2 PDM Course structure

I-Semester

S.No	Course Code	Subject
1	A2PDT301	Product design
2	A2PDT302	Advance manufacturing technology
3	A2PDT4XX	Professional Elective-I
4	A2PDT4XX	Professional Elective-II
5	A2PDL301	CAD Laboratory
6	A2PDL302	CNC and Robotics Laboratory
7	A2PDT303	Research methodology and IPR
8	A2PDA701	Stress Management by YOGA

Professional Elective-I		
S.No	Course Code	Course Title
1	A2PDT401	**Project management**
2	A2PDT402	Quality and reliability engineering
3	A2PDT403	Industrial design and ergonomics
Professional Elective-II		
S.No	Course Code	Course Title
1	A2PDT404	Mechotronics and Robotics
2	A2PDT405	Lean & Agile Manufacturing
3	A2PDT406	**Flexible Manufacturing Systems**

II-Semester

S.No	Course Code	Course Title
1	A2PDT304	Design for manufacture and assembly
2	A2PDT305	Finite Element Methods
3	A2PDT4XX	Professional Elective-III
4	A2PDT4XX	Professional Elective-IV
5	A2PDL303	Advanced Manufacturing Laboratory
6	A2PDL304	CAE Laboratory
7	A2PDA702	English for Research Paper Writing
8	A2PDP601	Mini-Project

Professional Elective-III		
S.No	Course Code	Course Title
1	A2PDT407	**Advanced machine design**
2	A2PDT408	Mechanical vibrations
3	A2PDT409	Advanced Metallurgy
Professional Elective-IV		
S.No	Course Code	Course Title
1	A2PDT410	**Surface Processing Techniques**
2	A2PDT411	Product Life Management
3	A2PDT412	Non-traditional machining processes

III- Semester

S.No	Course Code	Course Title
1	A2PDT4XX	Professional Elective-V
2	A2XXT5XX	Open Elective
3	A2PDP602	Project Phase -I

S.No	Course Code	Course Title
1	A2PDP603	Project Phase -II

Professional Elective-V		
S.No	Course Code	Course Title
1	A2PDT413	Materials & Processes Selection
2	A2PDT414	**Digital Manufacturing**
3	A2PDT415	Six Sigma

Open Electives offered by Mechanical Department		
S.No	Course Code	Course Title
1	A2PDT501	Robotics
2	A2PDT502	Composite materials
3	A2PDT503	**Cost management of Engineering Projects**

M.Tech(VLSI)

Department of ECE
MVGR College of Engineering (A)
Mapping of courses of A1 Regulation to A2 Regulation

M.Tech:

Autonomous A1 Regulation				**Autonomous A2 Regulation**			
I Semester				**I Semester**			
S. No	**Subject**	**Credit**	**Remarks**	**S. No**	**Subject**	**Credit**	**Remarks**
1	VLSI Technology	4	-	1	RTL Simulation and Synthesis with PLD's	3	✓
2	Analog IC Design	4	Is there in II Sem of A2 Regulation	2	Digital IC Design	3	✓
3	Digital IC Design	4	✓	3	Professional Elective – I 1. Memory Technologies 2. Digital System Design 3. MOS Device Modelling	3	✓
4	CPLD & FPGA Architecture and Applications	4	-	4	Professional Elective – II 1. Full Custom Design 2. Selected Topics in Mathematics 3. System Modelling & Simulation	3	✓
5	**Elective – I** 1. Digital System Design 2. MOS Device Modeling 3. System Modeling and Simulation	3	✓	5	RTL Simulation and Synthesis Lab	2	✓
6	**Elective – II** 1. Digital Design With Verilog HDL **2. VLSI signal processing** 3. Logic Synthesis and Verification	3	Is there in Professional Elective III in II Sem of A2 Regulation	6	CMOS Digital Design Lab	2	✓
7	FPGA Laboratory	2	✓	7	Research Methodology & IPR	2	✓
				8	Audit Course – I 1. Constitution of India 2. Disaster Management 3. English for Research Paper Writing 4. Pedagogy Studies	--	✓
	Total Credits	**24**			Total Credits	**18**	

Autonomous A1 Regulation				Autonomous A2 Regulation			
II Semester				II Semester			
S. No	**Subject**	**Credit**	**Remarks**	**S. No**	**Subject**	**Credit**	**Remarks**
1	Low Power VLSI Design	4	✓	1	Analog IC Design	3	✓
2	CMOS Mixed Signal VLSI Design	4	✓	2	Partial Reconfigurable FPGA	3	✓
3	Testing and Testability	4	✓	3	Professional Elective – III 1. Low power VLSI Design 2. CMOS Mixed Signal VLSI Design 3. VLSI Signal Processing	3	✓
4	VLSI Physical Design Automation	4	✓	4	Professional Elective – IV 1. Testing and Testability 2. Optimization Techniques & Applications to VLSI 3. VLSI Physical Design Automation	3	✓
5	**Elective – III** 1. Custom IC Design 2. Hardware Software Co-Design 3. DSP Processors and Architectures	3	-	5	CMOS Analog Design Lab	2	✓
6	**Elective – IV** **1. Scripting Languages** 2. Optimization Techniques and applications to VLSI 3. Semiconductor Memory Design and Testing	3	Is there in Professional Elective V in III Sem of A2 Regulation ✓	6	Reconfigurable Computing Lab	2	✓
7	Custom IC Design Laboratory	2	✓	7	Mini Project	2	✓
				8	Audit Course – II 1. Personality Development through Life Enlightenment Skills 2. Sanskrit for Technical Knowledge 3. Stress Management by Yoga 4. Value Education	--	✓
	Total Credits	**24**			Total Credits	**18**	

Autonomous A1 Regulation				Autonomous A2 Regulation			
III Semester				III Semester			
S. No	**Subject**	**Credit**	**Remarks**	**S. No**	**Subject**	**Credit**	**Remarks**
1	Research Methodologies	2	Is there in in I Sem of A2 Regulation	1	Professional Elective – V 1. Communication Network 2. SoC Architecture 3. Scripting Languages	3	✓
2	Comprehensive Viva-Voce	2	-	2	Open Elective – I 1. Business Analytics 2. Industrial Safety 3. Operations Research 4. Cost Management of Engineering Projects 5. Composite Materials 6. Waste to Energy	3	✓
3	Self-Study (Pre-requisite)	2	-	3	Dissertation Phase – I	10	✓
4	Seminar	2	-	4			
5	Project Phase – I	8	✓	5			
	Total Credits	**16**			Total Credits	**16**	

Autonomous A1 Regulation				Autonomous A2 Regulation			
IV Semester				IV Semester			
S. No	**Subject**	**Credit**	**Remarks**	**S. No**	**Subject**	**Credit**	**Remarks**
1	Project Phase – II	16	✓	1	Dissertation Phase – II	16	✓
2							
	Total Credits	**16**			Total Credits	**16**	

1. In Sem I,VLSI technology, CPLD and FPGA Architecture and applications are dropped and RTL simulation synthesiswith PLDs introduced in A2 regulation.
2. FPGA lab is dropped and two new labs RTL simulation and synthesis lab and CMOS digital design lab were introduced in A2 regulation .
3. Elective III was dropped and Audit course has been introduced.
4. In Sem 1,Custom IC design lab was dropped and two new labs CMOS analog design lab ,Reconfigurable computing lab were introduced .
5. Mini project and Audit courses were also introduced in A2 regulation.
6. In sem III, comprehensive viva-voice, self study and seminar were dropped and open electives and professional electives were introduced in A2 regulation.
7. In A1 regulation 80 credits are there, where as 68 credits are there in A2 regulation as per AICTE norms.
8. Overall 45 percent variation is there between A1 and A2 regulation where 30 percent variation is due to courses variation and about 15 percent variation is due to internal syllabus change.