VIGNAN'S
Foundation for Science, Technology & Research
(Deemed to be University)
Estd. U/S 3 of UGC Act 1956

DEPARTMENT OF CHEMISTRY

CIRCULAR

Date: 01.03.2023

The Department of Chemistryis going to conduct 2nd Board of Studies (BoS) meeting for finalizing Chemistry and Environmental Science related B. Tech. courses offered as per R22 curriculumon **11.03.2023** from **9.00am**in blended mode. The physical meeting will be held at Office of Dean AS&H, 3rd Floor, A Block, VFSTR and the zoom link of thesame meeting in virtual mode (https://us06web.zoom.us/j/7644856231?pwd=N0Nkem4vRm16RUtYU1B0bjk2eHgwQT09). All the members are requested to make it convenient to attend the meeting.

The members are

1. Prof. KoyaPrabhakara Rao, Head, Dept. of Chemistry, VFSTR - Chairperson
2. Prof. G. Ranga Rao, Dept. of Chemistry, IIT Chennai, Tamil Nadu - External Member (Academic)
3. Prof. R. Balamurugam, School of Chemistry, University of Hyderabad, Telangana - External Member (Academic)
4. Dr. K. Suresh Babu, Senior Principle scientist, Natural Products Division, CSIR-IICT, Hyderabad, Telangana – External Member (Academic)
5. Prof. N. Srinivasu, Dean, Applied Science & Humanities (AS&H) and Professor, Dept. of Chemistry, VFSTR - Internal Member
6. Prof. N. Satyasree, Professor, Dept. of Chemistry, VFSTR - Internal Member
7. Prof. D. Nagaraju, Professor, Dept. of Chemistry, VFSTR - Internal Member
8. Dr. Shaik Anwar, Associate Professor, Dept. of Chemistry, VFSTR - Internal Member
9. Dr. M. Sireesha, Associate Professor, Dept. of Chemistry, VFSTR - Internal Member
10. Dr. Anandarup Goswami - Associate Professor, Dept. of Chemistry, VFSTR - Internal Member
11. Dr. V. Srinivasadesikan - Associate Dean, IQAC and Associated Professor, Dept. of Chemistry, VFSTR - Internal Member
12. Dr. Shubhalakshmi Sengupta, Scientist, Dept. of Chemistry, VFSTR - Internal Member
13. Dr. Ravi Kumar Kottalanka, Associate Professor, Dept. of Chemistry, VFSTR - Member Secretary

Agenda of the BoS Meeting:

1. To discuss and finalize the detailed syllabi of various Chemistry and Environmental Science courses offered by the Department of Chemistry in R22 B.Tech. curriculum.The syllabi of the courses were previously discussed during Department Council (DC) meeting held on 27th January 2023 and the suggestions were also incorporated.
2. To approve the necessary changes made into the syllabi of different courses of R22 curriculum offered by the department of Chemistry for submission to the HoDs/Academic Council for further approval.

Chairperson

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DEPARTMENT OF CHEMISTRY

Date: 11.03.2023

Minutes of Board of Studies Meeting

Board of Studies (BoS) meeting to finalize the courses offered by the department of Chemistry for B.Tech.,R22 curriculum was conducted on **11.03.2023**in blended mode from **9.00am to 1.00pm** in blended mode. The physical meeting was held at Office of Dean AS&H, 3rd Floor, A Block, VFSTR while some of the external committee members attended the meeting via virtual mode (zoom link for the meeting: https://us06web.zoom.us/j/7644856231?pwd=N0Nkem4vRm16RUtYU1B0bjk2eHgwQT09).

Agenda of the BoS Meeting:

1. To Discuss and finalize the detailed syllabi of various Chemistry and Environmental Science courses offered by the department of Chemistry in R22 B.Tech. curriculum.
2. To approve the necessary changes made into the syllabi of different courses of R22 curriculum offered by the department of Chemistry for submission to the HoDs/Academic Council for further approval

The following members were present either thorough offline or online.

S.No.	Name and designation of the Member	Position	Signature
1.	Prof. KoyaPrabhakara Rao, Head, Dept. of Chemistry, VFSTR	Chairperson	
2.	Prof. G. Ranga Rao, Dept. of Chemistry, IIT Chennai, Tamil Nadu	External Member (Academic)	Attended online (Screenshot is attached)
3.	Prof. R. Balamurugam, School of Chemistry, University of Hyderabad, Telangana	External Member (Academic)	Attended online (Screenshot is attached)
4.	Dr. K. Suresh Babu, Senior Principle scientist, Natural Products Division, CSIR-IICT, Hyderabad, Telangana	External Member (Academic)	Attended online (Screenshot is attached)

S.No.	Name and designation of the Member	Position	Signature
5.	Prof. N. Srinivasu, Dean, Applied Science & Humanities (AS&H) and Professor, Dept. of Chemistry, VFSTR	Internal Member	
6.	Prof. N. Satyasree, Professor, Dept. of Chemistry, VFSTR	Internal Member	
7.	Prof. D. Nagaraju, Professor, Dept. of Chemistry, VFSTR	Internal Member	
8.	Dr. Shaik Anwar, Associate Professor, Dept. of Chemistry, VFSTR	Internal Member	
9.	Dr. M. Sireesha, Associate Professor, Dept. of Chemistry, VFSTR	Internal Member	
10.	Dr. Anandarup Goswami - Associate Professor, Dept. of Chemistry, VFSTR	Internal Member	
11.	Dr. V. Srinivasadesikan - Associate Dean, IQAC and Associated Professor, Dept. of Chemistry, VFSTR	Internal Member	
12.	Dr. Shubhalakshmi Sengupta, Scientist, Dept. of Chemistry, VFSTR	Internal Member	
13.	Dr. Ravi Kumar Kottalanka, Associate Professor, Dept. of Chemistry, VFSTR	Member Secretary	

Minutes of BoS meeting:

Chairperson Prof. Koya Prabhakara Rao, Professor and Head, Dept. of Chemistry, VFSTR opened the meeting by welcoming and introducing the external members to the internal members. He briefly introduced *NEP 2020*and explained how the upcoming R22 B. Tech. curriculum at VFSTR complies with all the requirements emphasizingcontinuous learning and continuous assessment models. In addition, he also stressed on the importance of courses related to Chemistry and Environment Science for B. Tech. students. The member secretary then provided a clear picture about the proposed course structure and the differences from previous regulation. He then introduced the Chemistry and Environmental Science related courses, offered by the department, individually, underscored the modifications and seek suggestions from the committee members. In addition to the 7 core courses offered by the department, 9 elective courses were also proposed (Appendix I).

The following points were discussed in the BoS meeting:

1. Regulation R22.
2. Curriculum structure with credits, credits distribution.

3. Necessity of Chemistry and Environmental Science based courses in B. Tech. curriculum.
4. Need of practical/project-oriented courses in B. Tech. curriculum.
5. Importance of branch specific chemistry core courses.
6. Requirement of branch specific advanced elective Chemistry courses.
7. Feedback collected from stakeholders.

Outcome of the discussion:

1. BoS Members (especially external members) appreciated the efforts taken by VFSTR to incorporate the features of NEP 2020 into R22 curriculum. They liked the regulations, assessment models, and the modular structure. With special regard to Chemistry and Environment Science related courses, they looked at the individual syllabi carefully and shred their valuable opinions. The course structure is provided in Appendix-I.
2. In comparison to previous relevant Chemistry and Environment Science course, major restructuring has taken place to make them more oriented towards continuous learning and assessment based on modular structure. In addition, special emphasis has been given to practical/project-centric curriculum.
3. Branch specific topics/courses have been included aiming towards skill development and employability (Appendices-II and III).
4. While out of 7 core courses (related to specific branches), 5 of them could be considered new because of their higher percentage of changes (>20%), 9 new advanced elective courses have been introduced (Appendix-IV).

The following resolutions made after the discussion:

1. Upon the incorporation of the fruitful suggestions appropriately in the curriculum and syllabi of the regulation R22, the BoS members approved that the list of courses along with the detailed syllabi could be recommended to the HoDs/Academic Council of VFSTR for the approval.
2. Environmental Studies L-T-P-C credit structure was modified from 1-1-0-1 to 0-1-1-1 for all B. Tech. Courses except for AE and CSBS. The modification is done based on the feedback received from the students and the discussion among the faculty members, HoD and Dean, AAA. It was modified to create more interest among the students about practical environmental problems and to find the suitable solution for that environmental issue by providing various case studies as Assignments. However, final assessment will be done by conducting summative assessment as per R22 regulation proposed earlier.

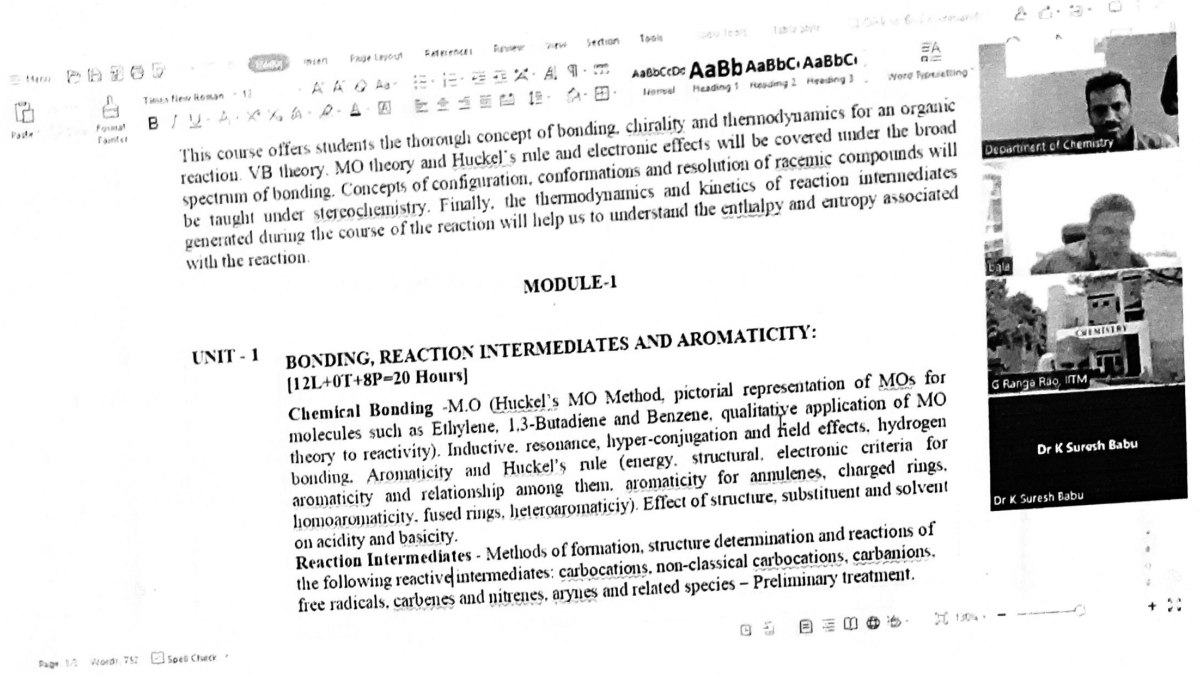
There being no further points for discussion, the Chairperson thanked all the external, internal, invited members and announced that the meeting was adjourned.

Member Secretary

Chairperson

Department of Chemistry
Dt. 14/2/23
VFSTR University, Vadlamudi

The pictures taken during Zoom meeting on 11th March 2023



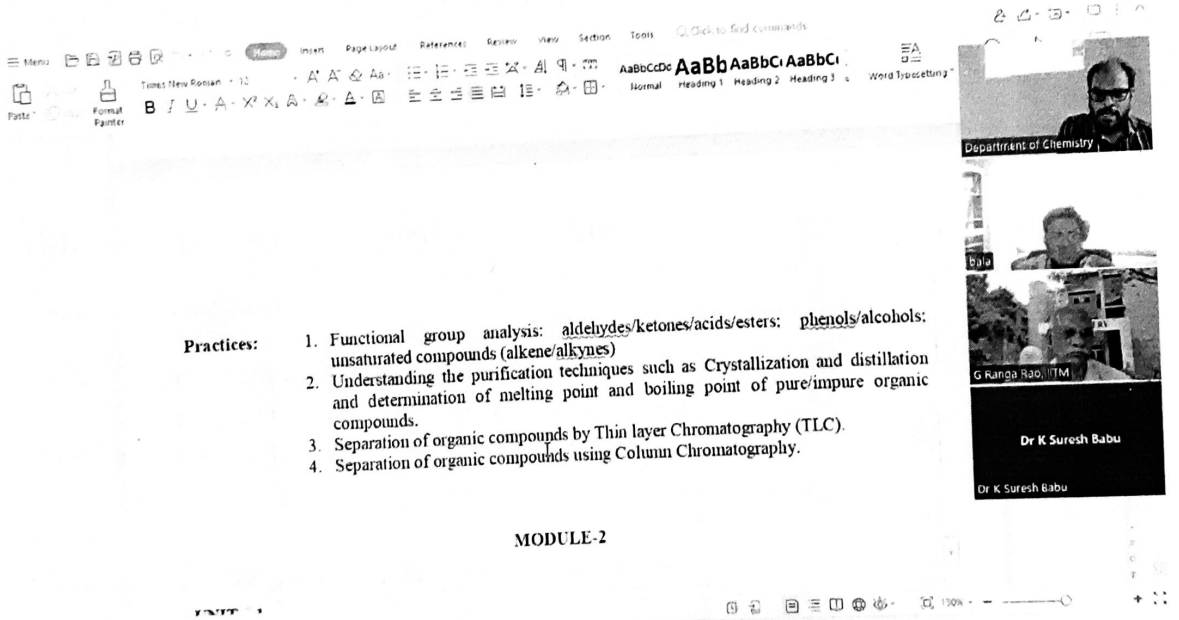
This course offers students the thorough concept of bonding, chirality and thermodynamics for an organic reaction. VB theory, MO theory and Huckel's rule and electronic effects will be covered under the broad spectrum of bonding. Concepts of configuration, conformations and resolution of racemic compounds will be taught under stereochemistry. Finally, the thermodynamics and kinetics of reaction intermediates generated during the course of the reaction will help us to understand the enthalpy and entropy associated with the reaction.

MODULE-1

UNIT - 1 **BONDING, REACTION INTERMEDIATES AND AROMATICITY:**
[12L+0T+8P=20 Hours]

Chemical Bonding -M.O (Huckel's MO Method, pictorial representation of MOs for molecules such as Ethylene, 1,3-Butadiene and Benzene, qualitative application of MO theory to reactivity). Inductive, resonance, hyper-conjugation and field effects, hydrogen bonding, Aromaticity and Huckel's rule (energy, structural, electronic criteria for aromaticity and relationship among them, aromaticity for annulenes, charged rings, homoaromaticity, fused rings, heteroaromaticiy). Effect of structure, substituent and solvent on acidity and basicity.

Reaction Intermediates - Methods of formation, structure determination and reactions of the following reactive intermediates: carbocations, non-classical carbocations, carbanions, free radicals, carbenes and nitrenes, arynes and related species – Preliminary treatment.



Practices:

1. Functional group analysis: aldehydes/ketones/acids/esters; phenols/alcohols; unsaturated compounds (alkene/alkynes)
2. Understanding the purification techniques such as Crystallization and distillation and determination of melting point and boiling point of pure/impure organic compounds.
3. Separation of organic compounds by Thin layer Chromatography (TLC).
4. Separation of organic compounds using Column Chromatography.

MODULE-2

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DEPARTMENT OF CHEMISTRY

APPENDIX I

Curriculum Structure of B. Tech. Chemistry Courses

I Year I Semester Structure of Chemistry Courses

S. No.	Branch(es)	Course Title	L	T	P	C	Remarks	Course Offered By
1.	TT & CHEM	Applied Chemistry	2	-	2	3	Basic Sciences	Dept. of Chemistry
2.	AGE	Chemistry for Agricultural Engineering	2	-	2	3	Basic Sciences	Dept. of Chemistry
3.	AGE	Environmental Science and Disaster Management	2	0	2	3	Basic Sciences	Dept. of Chemistry
4	CSBS	Environmental Studies - CSBS	2	0	0	0	Basic Sciences	Dept. of Chemistry
		Total	**NA**	**NA**	**NA**	**NA**		
		Contact Hours	NA					

L=Lecture; T= Tutorial; P= Practical; C=Credits

General instructions

- for each semester, credits may be max. of **25 credits** and max. of **35 contact hours** including all courses. (must not exceed this in any case)
- NO courses are allowed with only L structure, all courses should be either L+T+P, L+P, L+T, T+P structure based on the credits. 1L=1 Credit, 2T or 2P=1 Credit.

I Year II Semester Structure of Chemistry Courses

S. No.	Branch(es)	Course Title	L	T	P	C	Remarks	Course Offered By
1.	MECH, RA, EEE & CIVIL	Engineering Chemistry	2	-	2	3	Basic Sciences	Dept. of Chemistry
2.	CHEM	Organic Chemistry for Chemical Engineers	3	-	2	4	Basic Sciences	Dept. of Chemistry
3.	BT & BI	Organic Chemistry	2	-	2	3	Basic Sciences	Dept. of Chemistry
		Total	**NA**	**NA**	**NA**	**NA**		
		Contact Hours	NA					

II Year I Semester Structure of Chemistry Courses

S. No.	Branch(es)	Course Title	L	T	P	C	Remarks	Course Offered By
1.	**All branches (except AGE, CSBS)**	Environmental Studies	0	1	1	1	Basic Sciences	Dept. of Chemistry
		Total	**NA**	**NA**	**NA**	**NA**		
		Contact Hours	NA					

II Year II Semester Structure to IV Year II Semester Structure (all 8 semesters structure)

Response: NA (Open elective courses are mentioned separately below).

Chairperson

Department of Chemistry
VFSTR University, Vadlamudi

List of Department Elective Courses (if do not have streams, then just list in one column, if have odd / even pools then use two columns one for odd semester and another for even semester)

Response: NA

List of Open Elective Courses (if do not have streams, then just list in one column)

Basket name	Course Title	L	T	P	C	Remarks	Course Offered By
Course – 1 AS&H	Nanoscience and Technology	2	2	-	3	Can be offered in 2-2 (suitable for any branch)	Dept. of Chemistry
Course – 2 AS&H	Electronic and Optoelectronic Polymers	2	2	-	3	Can be offered in 2-2 (most suitable for ECE, EEE, MECH, RA, CHEM)	Dept. of Chemistry
Course – 3 AS&H	Chemistry in Daily Lives	2	2	-	3	Can be offered in 2-2 (suitable for any branch)	Dept. of Chemistry
Course – 4 AS&H	Electrochemical Energy Conversion and Storage	2	2	-	3	Can be offered in 3-1 (most suitable for ECE, EEE, MECH, RA, CHEM)	Dept. of Chemistry
Course – 5 AS&H	Nanobiotechnology	2	2	-	3	Can be offered in 3-1 (most suitable for BT, BM, FT, AGE, BI)	Dept. of Chemistry
Course – 6 AS&H	Chemistry for Emerging Technologies	2	2	-	3	Can be offered in 3-1 (suitable for any branch)	Dept. of Chemistry
Course – 7 AS&H	Bioremediation Technologies for Environmental Pollutants	2	2	-	3	Can be offered in 3-2 (most suitable for BT, BM, FT, AGE, BI, TT, CIVIL, CHEM)	Dept. of Chemistry
Course – 8 AS&H	Organic and Nanomaterials for Electronic and Optical Properties	2	2	-	3	Can be offered in 3-2 (most suitable for ECE, EEE, MECH, RA, CHEM)	Dept. of Chemistry
Course – 9 AS&H	Computational Chemistry	2	-	2	3	Can be offered in 3-2 (most suitable for CSE, IT, BT, BM, FT, AGE, BI)	Dept. of Chemistry

List of Honour/Specialization Courses (if do not have streams, then just list in one column)

Response: NA

List of Minor Courses (if do not have streams, then just list in one column)

Response: NA

Chairperson

Department of Chemistry
VFSTR University, Vadlamudi
Dt. 12/3/23

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DEPARTMENT OF CHEMISTRY

APPENDIX II

List of Courses that Enables Employability or Entrepreneurship or Skill Development

S. No.	Year and Semester	Branch(es)	Course Title	Employability / Entrepreneurship / Skill development
Course Courses				
1.	I Year I Semester	**TT & CHEM**	Applied Chemistry	Skill development
2.	I Year I Semester	**AGE**	Chemistry for Agricultural Engineering	Skill development
3.	I Year I Semester	**AGE**	Environmental Science and Disaster Management	Skill development
4.	I Year I Semester	**CSBS**	Environmental Studies	Skill development
5.	I Year II Semester	**MECH, RA, EEE & CIVIL**	Engineering Chemistry	Skill development
6.	I Year II Semester	**CHEM**	Organic Chemistry for Chemical Engineers	Skill development
7.	I Year II Semester	**BT & BI**	Organic Chemistry	Skill development
8.	II Year I Semester	**All (except AGE and CSBS)**	Environmental Studies	Skill development
Open Elective Courses				
9.	II Year II Semester	suitable for any branch	Nanoscience and Technology	Skill development/employability
10.	II Year II Semester	most suitable for ECE, EEE, MECH, RA, CHEM	Electronic and Optoelectronic Polymers	Skill development/employability
11.	II Year II Semester	suitable for any branch	Chemistry in Daily Lives	Skill development/employability
12.	III Year I Semester	most suitable for ECE, EEE, MECH, RA, CHEM	Electrochemical Energy Conversion and Storage	Skill development/employability
13.	III Year I Semester	most suitable for BT, BM, FT, AGE, BI	Nanobiotechnology	Skill development/employability
14.	III Year I Semester	suitable for any branch	Chemistry for Emerging Technologies	Skill development/employability
15.	III Year II Semester	most suitable for BT, BM, FT, AGE, BI, TT, CIVIL, CHEM	Bioremediation Technologies for Environmental Pollutants	Skill development/employability
16.	III Year II Semester	most suitable for ECE, EEE, MECH, RA, CHEM	Organic and Nanomaterials for Electronic and Optical Properties	Skill development/employability
17.	III Year II Semester	most suitable for CSE, IT, BT, BM, FT, AGE, BI	Computational Chemistry	Skill development/employability

Chairperson

Department of Chemistry
Dt. 12/9/22
VFSTR University, Vadlamudi

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DEPARTMENT OF CHEMISTRY

APPENDIX III

List of New Courses in the R22 Curriculum*

S. No.	Year and Semester	Branch(es)	Course Title	Employability / Entrepreneurship / Skill development
Course Courses				
1.	I Year I Semester	**TT & CHEM**	Applied Chemistry	Skill development
2.	I Year I Semester	**CSBS**	Environmental Studies - CSBS	Skill development
3.	I Year II Semester	**MECH, RA, EEE & CIVIL**	Engineering Chemistry	Skill development
4.	I Year II Semester	**CHEM**	Organic Chemistry for Chemical Engineers	Skill development
5.	I Year II Semester	**BT & BI**	Organic Chemistry	Skill development
6.	II Year I Semester	**All (except AGE, CSBS)**	Environmental Studies	Skill development
Open Elective Courses				
7.	II Year II Semester	suitable for any branch	Nanoscience and Technology	Skill development/employability
8.	II Year II Semester	most suitable for ECE, EEE, MECH, RA, CHEM	Electronic and Optoelectronic Polymers	Skill development/employability
9.	II Year II Semester	suitable for any branch	Chemistry in Daily Lives	Skill development/employability
10.	III Year I Semester	most suitable for ECE, EEE, MECH, RA, CHEM	Electrochemical Energy Conversion and Storage	Skill development/employability
11.	III Year I Semester	most suitable for BT, BM, FT, AGE, BI	Nanobiotechnology	Skill development/employability
12.	III Year I Semester	suitable for any branch	Chemistry for Emerging Technologies	Skill development/employability
13.	III Year II Semester	most suitable for BT, BM, FT, AGE, BI, TT, CIVIL, CHEM	Bioremediation Technologies for Environmental Pollutants	Skill development/employability
14.	III Year II Semester	most suitable for ECE, EEE, MECH, RA, CHEM	Organic and Nanomaterials for Electronic and Optical Properties	Skill development/employability
15.	III Year II Semester	most suitable for CSE, IT, BT, BM, FT, AGE, BI	Computational Chemistry	Skill development/employability

*The courses where the percentage of change in the total course content is more than 20% with respect to the last regulation are only considered. Hence, Chemistry for Agricultural Engineering and Environmental Science and Disaster Management which are designed based on ICAR curriculum and have only 15 and 18% change (primarily due to the incorporation of practices) are not included.

General instructions

- If the percentage of change in the total course content is more than 20%, the course can be considered as NEW COURSE
- Core courses offered by other departments (i.e., S&H, computer courses) should also be included here if they satisfy the above criteria

Chairperson

Department of Chemistry
VFSTR University, Vadlamudi
Dt. 12/3/23

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DEPARTMENT OF CHEMISTRY

APPENDIX IV

Comparison of Course Contents between R21 and R22 Curriculum

(Should be maintained by BoS member for future reference)

S. No.	Year and Semester	Course Title	% of Changes
Core Courses			
1.	I Year I Semester	Applied Chemistry	40
2.	I Year I Semester	Chemistry for Agricultural Engineering	15*
3.	I Year II Semester	Environmental Studies - CSBS	40
4.	I Year I Semester	Environmental Science and Disaster Management	18*
5.	I Year II Semester	Engineering Chemistry	40
6.	I Year II Semester	Organic Chemistry for Chemical Engineers	25
7.	I Year II Semester	Organic Chemistry	25
8.	II Year I Semester	Environmental Studies	40
Open Elective Courses			
9.	II Year II Semester	Nanoscience and Technology	NA (New course)
10.	II Year II Semester	Electronic and Optoelectronic Polymers	NA (New course)
11.	II Year II Semester	Chemistry in Daily Lives	NA (New course)
12.	III Year I Semester	Electrochemical Energy Conversion and Storage	NA (New course)
13.	III Year I Semester	Nanobiotechnology	NA (New course)
14.	III Year I Semester	Chemistry for Emerging Technologies	NA (New course)
15.	III Year II Semester	Bioremediation Technologies for Environmental Pollutants	NA (New course)
16.	III Year II Semester	Organic and Nanomaterials for Electronic and Optical Properties	NA (New course)
17.	III Year II Semester	Computational Chemistry	NA (New course)
Average % of Changes			**NA**

*As it follows the ICAR syllabus, only a slight modification was incorporated in terms of adding practices.

K. P. Rao

Chairperson

Department of Chemistry
Dt. 12/3/22
VFSTR University, Vadlamudi

General instructions

- Minor courses and Open electives offered BY OTHER DEPARTMENTS need not be included in this annexure.
- Minor courses and Open electives offered BY THE DEPARTMENTS are to be included in this annexure. Mentioning year and semester need not be included for these courses.

Chairperson