

CBIT Autonomous affiliated to Osmania University
DEPARTMENT OF CHEMISTRY
BOARD OF STUDIES MEETING OF CHEMISTRY

A meeting of Board of studies was held on 10th July 2020 at 2.30.pm with HOD chemistry to discuss the following agenda

1. To Revise the existing R18 syllabus of B.E 1/4 (ALL BRANCHES) of Engineering course Chemistry theory(18CYC01) and Chemistry lab (18CYC02) to the extent of 20 percent retaining the original syllabus frame as given by AICTE Model Curriculum.
2. To approve the evaluation pattern , credits and grades under Choice based credit system (CBCS) ,as given by the AICTE Model Curriculum 2018.
3. To approve list of paper setters and examiners.
4. Suggestions of Board of Studies (BOS).

COMPOSITION OF BOARD OF STUDIES

1. Chairman Dr.K.Laxmi
 Professor of Chemistry CBIT

2. Subject expert Dr.K.Shivaraj
 Professor of Chemistry, Osmania University, Hyderabad

3. Subject expert Dr.A.K. Durga Bhavani
 Professor of Chemistry , Osmania University

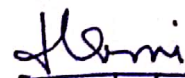
4. Subject expert Prof.Ravindra Nath
 Professor of Chemistry School of Sciences
Moulana Azad National Urdu University, Hyderabad

5. Subject expert Dr. P. Rama Devi
 General Manager, DQA Hetero(R&D), Balanagar, Hyderabad

6. Member Dr. S.Shylaja Senior Assistant Professor of Chemistry CBIT

7. Member Dr. K. Ramesh Senior Assistant Professor of Chemistry CBIT

8. Member Dr.M.Mamatha Assistant Professor of Chemistry CBIT


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Item no.1 CONCEPTS IN CHEMISTRY FOR ENGINEERING

Chemistry theory syllabus is keenly studied by the subject experts and the existing modules in the syllabus were accepted and their titles were also further accepted. As the subtopics of these units were modified, Experts have decided the number of lecture hours for completion of each Unit.

- Unit I Atomic and molecular structure and Chemical Kinetics (8 lectures)
- Unit II Use of free energy in chemical equilibria (10 lectures)
- Unit III Stereochemistry and Organic reactions (13 lectures)
- Unit IV Water Chemistry (7 lectures)
- Unit V Engineering Materials and Drugs (9 lectures)

In Unit II it is decided to allot 6 lecture hours for Use of free energy in chemical equilibria topics and 4 lecture hours Battery technology and fuel cells..

Similarly in Unit IV there are two subunits Stereochemistry and Organic reactions for which 6 lecture hours are allotted to stereochemistry and 7 lectures for Organic reactions

Item no.2

The topics included in **Unit I Atomic and molecular structure** were retained as given by AICTE MODEL CURRICULUM 2018, except very few changes.

In unit -I in place of crystal field theory the topics of Chemical kinetics with the subtopics of rate of reaction, order & molecularity First order reaction-Characteristics: units of first order rate constant & its half-life period, second order reaction-Characteristics: units of second order rate constant & its half-life period. Numericals. were included.

This is suggested by the experts to maintain coordination between the theory and Lab syllabus as the experiments related to first order and second order reactions are being carried in the Lab sessions.

Item no.3

The topics included in **Unit II Use of free energy in chemical equilibria** are also retained as per AICTE MODEL CURRICULUM 2018 with revisions of the topics as follows

- Reference electrodes (NHE, SCE)
- The topic of Determination of pH using combined Glass calomel electrode is included in this unit in view of its importance .

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- In view of the remarkable increase in the applications of Lithium batteries and fuel cells, these topics are included in the syllabus.
- With respect to Lithium Batteries the topics of construction, working and applications of Li-MnO₂ and Li-ion batteries were included in the syllabus.
- With respect to Fuel cells , the topics added in the syllabus are Fuel Cells: Introduction, difference between conventional cell and fuel cell, limitations & advantages. Construction, working & applications of methanol-oxygen fuel.

Item no.4

Organic chemistry expert Dr.A.K.Durga Bhavani Madam expressed that all the topics included in Unit III i.e Stereochemistry and Organic Reactions are retained as that of 2018 existing syllabus without any changes.The idea behind this is these topics are to be studied essentially by the students at the under graduate level to acquire sufficient knowledge of organic chemistry.

Another suggestion made by Prof .K.Shivaraj is to make proper rearrangement in the existing topics included under Stereochemistry of Unit III. He has suggested to arrange the subtopics of conformational isomerism first followed by the topics of optical activity, symmetry and chirality,enantiomers,diastereomers, followed by Absolute configurations, Sequence rules for R&S notation.

Item no.5

For Unit IV Water Chemistry the subject experts suggested to retain all the topics with the intention that knowledge of hardness of water, water softening methods and Disinfection methods are essential to engineering students.

The topics of Alkalinity and Estimation of Alkalinity of water, Numericals, Softening of water by lime soda process , Numericals ; BOD and COD definition, Estimation (only brief procedure) and significance, Numericals were also added in this R 20 Syllabus.This is done as per the suggestion given by the experts in view of the importance of these topics in Water Chemistry.

Item no.6

In Unit V Engineering materials like polymers , conducting polymers, nano materials, were included. The topics of Thermoplastic polymers(ex:PVC) &Thermosetting polymers(Bakelite); Elastomers(ex: Natural rubber) were added taking into consideration of

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applications of these polymeric materials. Along with this the topic of Polymers for Electronics: Polymer resists for integrated circuit fabrication, lithography and photolithography is also added.

In the present BOS Meeting it is suggested by the experts to add the topic of Characterisation of nanomaterials by SEM and TEM – Principle, along with the existing topics of Nano materials- Introduction to nano materials and general applications, basic chemical methods of preparation- Sol gel method. Carbon nanotubes and their applications.

Item no.7

Dr.A.K.Durga Bhavani Madam and Dr.P.Rama Devi Madam during the BOS meeting suggested to continue with the topics of the study of drugs like Aspirin (analgesic), Paracetamol (antipyretic), atenolol (antihypertensive) up to their structure, synthesis and uses levels as per existing syllabus. The intention is it is essential to have sufficient knowledge and awareness about commonly used drugs.

In order to maintain a good coordination between theory and lab topics, the synthesis of drugs of Aspirin and Paracetamol is included in lab session experiments.

Item no.8

A list of ten text books were provided in the syllabus. In this three books are for physical chemistry, three books are for organic chemistry,two books are for Inorganic Chemistry and two books are suggested for engineering chemistry topics.

Separate text books are suggested for nanomaterials, polymers and drugs topics

Item no.9

In accordance to changes made in the syllabus of 2018, Course outcomes and Course objectives were modified in the present syllabus of 2020 i.e R20.

Corrections were also made in Course outcomes and Course objectives of R18 (2018) syllabus copies both for theory and lab.

All the course outcomes and course objectives were prepared in accordance with Blooms Taxonomy.

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Item no.10

For internal and external lab sessional and theory exams the Marks distribution is reviewed and finalized.

It is decided to allot 60/40 marks for External and Internal examinations respectively

It is insisted by the experts to give weightage to viva in the Lab Internal and External examination

Item no.11

As part of continuous internal evaluation system it is suggested by the experts to give two Assignments and two slip tests to the students in each semester.

Prof K.Shivaraj strongly recommended to give Innovative logical Assignments to the students, rather than routine Question & Answer type Assignments.

Item no.12

Chemistry practical lab syllabus is also studied in depth and a list of 13 experiments were finalized. The experiments included four lab sessions for volumetric analysis, two classes for chemical kinetics experiments i.e first order and second order reactions, ; four lab sessions for Instrumentation experiments – conductometry & Potentiometry titrations ; one lab session for synthesis of organic compound nitro Benzene; one session is for synthesis of resin like urea formaldehyde ; and one lab session is allotted for the synthesis of drugs Aspirin & Paracetamol.

Among volumetric experiments, two new experiments like Estimation of metal ions (Co^{2+} , Ni^{2+}) by EDTA method and Determination of Alkalinity of water are included.

Taking into consideration of importance of determination of the rate constants from concentration of reactants / products as a function of time, the following experiments of chemical kinetics were included

- Determination of rate constant for the reaction of hydrolysis of methyl acetate. (first order)

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- Determination of rate constant for the reaction between potassium per sulphate and potassium Iodide. (second order)

The experiments of conductometry & potentiometry were included with the intention of improving skills of the students in handling the instruments. These instrumental techniques enabled the accurate calculation of concentration and amount of various substances and the results were also confirmed graphically.

Students were also made to develop the basic drug molecules like Aspirin, Paracetamol and polymeric compounds like phenol formaldehyde resin. These experiments were included with the intention of providing the knowledge of Organic Chemistry.

For Chemistry Practical experiments a list of three text books were suggested by the experts.

For this revised copy Chemistry Practical Lab syllabus, Course outcomes and course objectives in accordance with Blooms Taxonomy were also incorporated

Item no.13

By taking into consideration of all the above suggestions discussed in the online BOS meeting the syllabus for Chemistry theory and Lab for B.E 1/4 (ALL BRANCHES) of Engineering course is revised and is well framed by adding new application oriented topics. The revised syllabus copy of Chemistry theory and Lab for B.E 1/4 (ALL BRANCHES) i.e R20 Syllabus is reviewed keenly by the subject experts, Members and Chairman of the BOS and is approved.

Dr. K. Laxmi
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