File Ref.No.23552/GA - IV - J2/2013/CU

UNIVERSITY OF CALICUT

Abstract

BSc in Chemistry-CUCBCSS UG 2014-Scheme and Syllabus- approved-implemented-w.e.f 2014 Admissions- modifications in the syllabus- corrigendum issued

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G & A - IV - J

U.O.No. 2317/2015/Admn Dated, Calicut University.P.O, 09.03.2015

Read:-1. U.O. No. 3797/2013/CU, dated 07.09.2013 (CBCSS UG Modified Regulations) (File.ref.no. 13752/GA IV J SO/2013/CU).

2. U.O. No. 5180/2014/Admn, dated 29.05.2014 (CBCSS UG Revised Regulations) (File.ref.no. 13752/GA IV J SO/2013/CU).

3. Item no. 8 of the minutes of the meeting of the Board of Studies in Chemistry UG held on 03.04.2014.

4.Item no. 21 of the minutes of the meeting of the Faculty of Science held on 27.06.2014.

5.Orders of the VC on 14.07.2014, in the file no, 18602/GA IV /J1/2013/CU.

6. U.O.No. 6824/2014/Admn Dated, Calicut University.P.O, 16.07.2014

7. Item No.III a39 of the minutes of LXXII meeting of the Academic Council held on 15.01.2015

8. Corrected syllabus forwarded by Chairman, Board of Studies in Chemistry UG.

9. Orders in the file of even No.

ORDER

The Modified Regulations of Choice Based Credit Semester System for UG Curriculum w.e.f 2014 was implemented under the University of Calicut vide paper read as (1).

The Revised CUCBCSS UG Regulations has been implemented w.e.f 2014 admission, for all UG programme under CUCBCSS in the University, vide paper read as (2).

The Board of Studies in Chemistry UG finalized the revised syllabus of Chemistry UG for implementation w.e.f the Academic Year 2014-2015. vide paper read as (3).

The Faculty of Science has also approved the minutes of the Board vide paper read as (4).

The Hon'ble Vice Chancellor, considering the exigency, exercising the powers of the Academic Council has approved the items regarding syllbus implementation in the minutes of the concerned Boards of Studies mentioned in the minutes of the Faculty of Science, subject to ratification by the

Academic Council, vide paper read as (5).

The Scheme & Syllabus for B.Sc in Chemistry- CUCBCSS UG 2014, w.e.f 2014 admission has been implemented vide paper read as (6).

The LXXII meeting of the Academic Council held on 15.01.2015, vide paper read as (7), ratified the action of Vice Chancellor in implementing the Scheme and Syllabus vide paper read as 5

As per paper read as (8), the Chairman Board of Studies in Chemistry UG suggests the following corrections in the syllabus implemented vide paper read as 6:

Page No.21, Line No.8: a sentence to be added: "*Conventional titration method shall be employed only in those cases where double burette titration method is not possible".*

Page No. 112: Footnote of Table 3: The sentence to be replaced as: 90% and above = 4, 80 to below 90% = 3.5, 70 to below 80% = 3, 60 to below 70% = 2.5, 50 to below 60% = 2, 40 to below 50% = 1.5, 35 to below 40% = 1, below 35% = 0.

Sanction has, therefore, been accorded for implementing the corrections in the syllabus.

Therefore the Scheme and Syllabus implemented vide paper read as (6) stands corrected to this effect.

Corrigendum is issued accordingly.

(The corrected syllabus is attached herewith and is available in the website:

www.universityofcalicut.info)

Usha K

Deputy Registrar

To

1. All Affiliated Colleges/SDE/Dept.s/Institutions under University of Calicut.
2. The Controller of Examinations, University of Calicut.
3. The Director SDE, University of Calicut.

Forwarded / By Order

Section Officer

UNIVERSITY OF CALICUT

B.Sc. DEGREE PROGRAMME
IN
CHEMISTRY

UNDER CHOICE BASED CREDIT AND SEMESTER SYSTEM

SCHEME AND SYLLABI

2014 ADMISSION ONWARDS

CORE COURSES, COMPLEMENTARY COURSES & OPEN COURSES

UNDERGRADUATE PROGRAMME – AN OVERVIEW

Programme means the entire course of study and examinations for the award of a degree. **Duration** of an undergraduate programme is six semesters distributed in a period of 3 years. An **academic week** is a unit of five working days in which distribution of work is organized from Monday to Friday with five contact periods of one hour duration on each day. A sequence of 18 such weeks (90 working days) constitutes a **semester**.

Course means a segment of subject matter to be covered in a semester. The undergraduate programme includes four types of courses, *viz.*, common courses, core courses, complementary courses and open course. **Common courses** include English and additional language courses. Every undergraduate student shall undergo 10 common courses [6 English courses and 4 additional language courses] for completing the programme. **Core courses** comprise compulsory course in a subject related to a particular degree programme offered by the parent department. There are 18 core courses including a project work. **Complementary courses** cover two disciplines that are related to the core subject and are distributed in the first four semesters. There shall be one **open course** in the 5^{th} semester. Students can opt one open course of their choice offered by any department in the institution other than their parent department.

Each course shall have a unique alphanumeric **code number**, which includes abbreviation of the subject in three letters, the semester number (1 to 6) in which the course is offered, the code of the course (A: Common course, B: Core course, C: Complementary course and D: Open course) and the serial number of the course (01, 02, *etc.*). For example, CHE5B06 represents a core course of serial number 06 offered in 5^{th} semester in B.Sc. Chemistry Programme.

Each course shall have certain credits. **Credit** is a unit of academic input measured in terms of weekly contact hours/course contents assigned to a course. For passing the degree programme, the students are required to achieve a minimum of **120 credits** as detailed below.

Common courses: 38 credits (22 for English courses + 16 for additional languages).

Core courses: 56 credits (including 2 credits for project work).

Complementary courses: 24 credits (12 credits each).

Open course: 2 credits.

UNDERGRADUATE PROGRAMME IN CHEMISTRY

PREFACE

With the pace that the world keeps and the speed with which technology advances, an understanding of science is inevitable in our day-to-day life. To make the study of science interesting and enjoyable, the creation of a scientific temper in society is a must which could be achieved through proper education and guidance. An effective science education can be imparted at the undergraduate level only by revamping the curriculum according to the needs and developments of the modern society from time to time. To achieve this goal, the curriculum should be restructured by giving emphasis on various aspects such as the creativity of students, knowledge of current developments in the discipline, awareness of environmental impacts due to the development of science and technology, and the skills essential for handling equipments and instruments in laboratories and industries.

Chemistry, being an experimental science, demands testing theories through practical laboratory experiences for a thorough understanding of the subject. Nowadays, chemistry laboratories in academic institutions use large amounts of chemicals. The ever rising cost of chemicals adversely affects many of the practical exercises. The fumes, gases and wastes produced during chemical reactions pollute the environment and affect public health. The awareness and implementation of eco-friendly experiments thus becomes a global necessity. It is in this context, that the need for greener approaches becomes more relevant. It is essential to ensure that laboratory chemicals are used at a minimal level without affecting the skill and understanding aimed through laboratory sessions. The change brought about in the present scheme makes use of micro scale techniques and double burette titrations. This has been done without any conceptual deviation from the principles of experiments. This method not only reduces the expenditure on chemicals but also creates an environmental awareness among the students and pollution free atmosphere in the campus. This scheme saves time and energy of students while performing the experiments.

The syllabus has been prepared in a participatory manner, after discussions with a number of faculty members in the subject and uploading the draft syllabus in the university website and collecting the feedback. As far as possible, the suggested modifications from the teaching community have been incorporated into the syllabus. During the preparation of the syllabus, the existing syllabus, the syllabi of XIth & XIIth standards, UGC model curriculum and

the syllabi of other universities have also been referred to. Care has been taken to ensure that the syllabus is compatible with the syllabi of other universities at the same level. Sufficient emphasis is given in the syllabus for training in laboratory skills and instrumentation.

The units of the syllabus are well defined. The number of contact hours required for each unit is also given. A list of reference books is provided at the end of each course.

AIMS

This curriculum has been prepared with the objective of giving sound knowledge and understanding of chemistry to undergraduate students. The goal of the syllabus is to make the study of chemistry stimulating, relevant and interesting. It has been prepared with a view to equip students with the potential to contribute to academic and industrial environments. This curriculum will expose students to various fields in chemistry and develop interest in related disciplines. Chemistry, being a border science to biology, physics and engineering, has a key role to play in the understanding of these disciplines. The updated syllabus is based on an interdisciplinary approach to understand the application of the subject in daily life.

BROAD OBJECTIVES

To enable the students

- To understand basic facts and concepts in chemistry.
- To develop the ability for applying the principles of chemistry.
- To appreciate the achievements in chemistry and to know the role of chemistry in nature and in society.
- To familiarize the emerging areas of chemistry and their applications in various spheres of chemical sciences and to apprise the students of its relevance in future studies.
- To develop skills in the proper handling of instruments and chemicals.
- To be exposed to the different processes used in industries and their applications.
- To make the students eco-friendly by creating a sense of environmental awareness in them.
- To make the students aware of the applications of chemistry in day-to-day life.

COURSE STRUCTURE

Credit Distribution

Semester	*Common course*		*Core course*	*Complementary course*		*Open course*	*Total*
	English	*Additional Language*		*Mathematics*	*Physics*		
I	4+3	4	2	3	2	-	18
II	4+3	4	2	3	2	-	18
III	4	4	3	3	2	-	16
IV	4	4	3+4*	3	2+4*	-	24
V	-	-	3+3+3	-	-	2	11
VI	-	-	3+3+3+3+3 +4*+4*+4*+ 4*+2**	-	-	-	33
Total	**22**	**16**	**56**	**12**	**12**	**2**	**120**

*Practical **Project

Mark Distribution and Indirect Grading System

Mark system is followed instead of direct grading for each question. After external and internal evaluations marks are entered in the answer scripts. All other calculations, including grading, will be done by the university using the software. Indirect Grading System in 7 point scale is followed. Each course is evaluated by assigning marks with a letter grade (A^+, A, B, C, D, E or F) to that course by the method of indirect grading.

Mark Distribution

Sl. No.	*Course*	*Marks*
1	English	600
2	Additional Language	400
3	Core course: Chemistry	1750
4	Complementary course: Mathematics	400
5	Complementary course: Physics	400
6	Open Course	50
	Total Marks	**3600**

Seven point Indirect Grading System

% of Marks	*Grade*	*Interpretation*	*Grade Point Average*	*Range of Grade points*	*Class*
90 and above	A^+	Outstanding	6	5.5 - 6	First Class with distinction
80 to below 90	A	Excellent	5	4.5 – 5.49	
70 to below 80	B	Very good	4	3.5 – 4.49	First Class
60 to below 70	C	Good	3	2.5 – 3.49	
50 to below 60	D	Satisfactory	2	1.5 – 2.49	Second Class
40 to below 50	E	Pass/Adequate	1	0.5 – 1.49	Pass
Below 40	F	Failure	0	0 – 0.49	Fail

CREDIT AND MARK DISTRIBUTION IN EACH SEMESTERS

Total Credits: 120; Total Marks: 3600

Semester	*Course*	*Credit*	*Marks*
I	Common course: English	4	100
	Common course: English	3	100
	Common course: Additional Language	4	100
	Core Course I: Theoretical and Inorganic Chemistry-I	2	100
	Complementary course: Mathematics	3	100
	Complementary course: Physics	2	80
	Total	**18**	**580**
II	Common course: English	4	100
	Common course: English	3	100
	Common course: Additional Language	4	100
	Core Course II: Theoretical and Inorganic Chemistry-II	2	100
	Complementary course: Mathematics	3	100
	Complementary course: Physics	2	80
	Total	**18**	**580**
III	Common course: English	4	100
	Common course: Additional Language	4	100
	Core Course III: Physical Chemistry-I	3	100
	Complementary course: Mathematics	3	100
	Complementary course: Physics	2	80
	Total	**16**	**480**
IV	Common course: English	4	100
	Common course: Additional Language	4	100
	Core Course IV: Organic Chemistry-I	3	100
	Core Course V: Inorganic Chemistry Practical-I	4	100
	Complementary course: Mathematics	3	100
	Complementary course: Physics	2	80
	Complementary course: Physics Practical	4	80
	Total	**24**	**660**
V	Core Course VI: Inorganic Chemistry-III	3	100
	Core Course VII: Organic Chemistry-II	3	100
	Core Course VIII: Physical Chemistry-II	3	100
	Open course	2	50
	Total	**11**	**350**
VI	Core Course IX: Inorganic Chemistry-IV	3	100
	Core Course X: Organic Chemistry-III	3	100
	Core Course XI: Physical Chemistry-III	3	100
	Core Course XII: Advanced and Applied Chemistry	3	100
	Core Course XIII: Elective	3	100
	Core Course XIV: Physical Chemistry Practical	4	100
	Core Course XV: Organic Chemistry Practical	4	100
	Core Course XVI: Inorganic Chemistry Practical-II	4	100
	Core Course XVII: Inorganic Chemistry Practical-III	4	100
	Core Course XVIII: Project Work	2	50
	Total	**33**	**950**

SYLLABUS

FOR

CORE COURSES

Core Course Structure
Total Credits: 56 (Internal: 20%; External: 80%)

Semester	*Code No*	*Course Title*	*Hrs/ Week*	*Total Hrs*	*Credit*	*Marks*
I	CHE1B01	Core Course I: Theoretical and Inorganic Chemistry-I	2	36	2	100
	-	Core Course V : Inorganic Chemistry Practical-I	2	36	-*	-
II	CHE2B02	Core Course II: Theoretical and Inorganic Chemistry-II	2	36	2	100
	-	Core Course V : Inorganic Chemistry Practical-I	2	36	-*	-
III	CHE3B03	Core Course III: Physical Chemistry-I	3	54	3	100
	-	Core Course V : Inorganic Chemistry Practical-I	2	36	-*	-
IV	CHE4B04	Core Course IV: Organic Chemistry-I	3	54	3	100
	CHE4B05(P)	Core Course V : Inorganic Chemistry Practical-I	2	36	4	100
V	CHE5B06	Core Course VI: Inorganic Chemistry-III	3	54	3	100
	CHE5B07	Core Course VII: Organic Chemistry-II	4	72	3	100
	CHE5B08	Core Course VIII: Physical Chemistry-II	4	72	3	100
	-	Core Course XIV: Physical Chemistry Practical	5	90	-**	-
	-	Core Course XV: Organic Chemistry Practical	5	90	-**	-
	-	Core Course XVIII: Project Work	2	36	-**	-
VI	CHE6B09	Core Course IX: Inorganic Chemistry-IV	3	54	3	100
	CHE6B10	Core Course X: Organic Chemistry-III	3	54	3	100
	CHE6B11	Core Course XI: Physical Chemistry-III	3	54	3	100
	CHE6B12	Core Course XII: Advanced and Applied Chemistry	3	54	3	100
	CHE6B13(E1)	Core Course XIII: Elective*** — 1. Industrial Chemistry	3	54	3	100
	CHE6B13(E2)	2. Polymer Chemistry				
	CHE6B13(E3)	3. Medicinal and Environmental Chemistry				
	CHE6B14(P)	Core Course XIV: Physical Chemistry Practical	-	-	4**	100
	CHE6B15(P)	Core Course XV: Organic Chemistry Practical	-	-	4**	100
	CHE6B16(P)	Core Course XVI: Inorganic Chemistry Practical-II#	5	90	4	100
	CHE6B17(P)	Core Course XVII: Inorganic Chemistry Practical-III	5	90	4	100
	CHE6B18(Pr)	Core Course XVIII: Project Work	-	-	2**	50
				Total	**56**	**1750**

* Exam will be held at the end of 4th semester

** Exam will be held at the end of 6th semester

***An institution can choose any one among the three courses.

#Includes industrial visit also. Marks: 85 (Inorganic Chemistry Practical–II) + 15 (Industrial visit).