# Swami Ramanand Teerth Marathwada University, Nanded


## B. O. S. IN CHEMISTRY
## B. SC. THIRD YEAR (CHEMISTRY)
## SEMESTER- V & VI
## CBCS Course
## Effective from JUNE – 2018

# Swami Ramanand Teerth Marathwada University, Nanded
## Choice Based Credit System (CBCS) Course
## Structure Faculty of Science
## B. Sc. Third Year Syllabus
## Semester Pattern Effective From June 2018
## Subject: Chemistry

| Semester | Course No | Name of the course | Instruction Hrs/Week | Total Period | CA (Int.) | ESC (Ext.) | Total Marks | Credits |
|---|---|---|---|---|---|---|---|---|
| V | DSEC- V (Section A) | Theory Paper-XII Organic+Inorganic Chemistry (P-XII) | 03 | 45 | 10 | 40 | 50 | 02 |
| | DSEC- V (Section B) (Elective) | Theory Paper-XIII Physical+Inorganic Chemistry (P-XIII)-B1 OR (Elective Paper) Physical+Inorganic Chemistry (P-XIII) B2 | 03<br>03 | 45<br>45 | 10<br>10 | 40<br>40 | 50<br>50 | 02 |
| | DSECP- IV (DSEC V &VI (Section A)] | Practical's based on P-XII & P-XIV (P-XVI) | 04 | Practicals 08<br>08 | 05<br>05 | 20<br>20 | 25<br>25 | 01<br>01 |
| | DSEC- IV ( Elective) | Practical's based on (Elective) | 02 | 08 | 05 | 20 | 25 | |
| | DSECP-III SEC III (Any one Skill from optional ) | (A) Applied Analytical Chemistry OR (A) Computer Application in Chemistry | 02+01=03 | 45 | 25 | 25 | 50 | (02)* |
| VI | DSEC VI (Section A) (Elective) | Theory Paper-XIV Organic+Inorganic Chemistry (P-XIV)-A1 OR (Elective Paper) Organic+Inorganic Chemistry (P-XIV)-A2 | 03<br>03 | 45<br>45 | 10<br>10 | 40<br>40 | 50<br>50 | 02 |
| | DSEC VI (Section B) | Theory Paper-XV Physical+Inorganic Chemistry (P-XV) | 03 | 45 | 10 | 40 | 50 | 02 |
| | DSECP- IV (DSEC V &VI (Section B)] | Practical's based on P-XIII &P-XV (P-XVII) | 04 | Practicals 08<br>08 | 05<br>05 | 20<br>20 | 25<br>25 | 01<br>01 |
| | DSEC- IV (Elective) | Practical's based on (Elective) | 02 | 08 | 05 | 20 | 25 | |
| | DSEC IV SEC IV (Any one Skill from optional) | (B) Spectroscopic Techniques and Cosmetic Preparation OR (B) Basic Analytical Chemistry | 02+01=03 | 45 | 25 | 25 | 50 | (02)* |
| | Total credits semester V and VI | | | | | | 12(04)* = 16 | |

DESC: Discipline Subject Elective Chemistry, DESCP: Discipline Subject Elective Chemistry Practical.
ESE: End of Semester Examination, CA: Continuous Assessment, SECC: Skill Enhancement Course Chemistry.
Distribution of Credits: 80% of the total Marks for ESE and 20% for CA.

- CA of Marks 10 : 10 Marks for test. - CA of 25 Marks: 15 Marks for Seminar & 10 Marks for test.

Suggestions: The end examination of Skill Enhancement Course should be conducted on the separate day by calling all the students who have opted Chemistry as SEC.

B. Sc. Third Year: Semester-V
Paper-XIII, (DSEC-V, Section B)
(B1)
Physical & Inorganic Chemistry

Marks – 50 Periods – 45

Section – A (Physical Chemistry)

**Unit –I**

1.1.1. Spectroscopy-I : 09 Periods

a) Brief introduction to molecular Spectroscopy. Width and intensity of spectral lines. Factors affecting width and intensity of spectral line.

b) Rotational spectra :
Classification of molecules, Rotational spectra of diatomic molecules.(Rigid rotator model) Moment of inertia, energy levels of rigid rotator, selection rule, spacing between spectral lines of diatomic rigid rotator, isotopic effect. Numerical.

c) Vibrational Spectra:
Infrared spectrum, simple harmonic oscillator model, energy levels of simple harmonic oscillator, selection rule, pure vibrational spectrum, intensity, determination of force constant, qualitative relation between force constant and bond energies. Numerical on force constant.

**Unit –II**

1.1.2. Spectroscopy-II: 05 Periods

a) Raman spectra :
Raman effect,Concept of polarazability, classical and quantum theory of Raman scattering, rotational Raman spectrum of a diatomic molecule. Experimental Raman Spectroscopy.

b) Electronic spectra :
Concept of potential energy curve, Franck-Condon Principle, Types of electronic transistions.

**Unit III**

1.1.3. Chemical Kinetics: 08 Periods

a) Introduction, Third order reaction with equal concentration of all reactants, characteristics of third order reaction.

b) Kinetics of complex reaction : i) Opposing reaction ii) Consecutive reaction

c) Kinetics of Photochemical reaction : i) Hydrogen –chlorine reaction ii) Decomposition of HI iii) Dimerization of anthracene.

**Unit IV**

1.1.4. Distribution Law: 08 Periods

a) Introduction, Nernst Distribution law, Solubility and distribution law, Limitations of law.
b) Association and dissociation of solute in solvent.
c) Henry's law.
d)Determination of equilibrium constant from distribution coefficient.
e) Extraction of solvent.
f) Liquid -liquid chromatography.
g) Applications of distribution law.
h) Numerical on distribution law