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1.3.1. QLM : Professional Ethics - chemistry

## Sem. IV

### CHE(O) 507 Scientific Writing

- Writing of Research Article/Review Article/Commentary Article/Case Study/Monograph/Book Chapter/Book Review/Research Proposal or any other scientific article type.
- The student can select any one scientific writing type or research proposal and submit a copy (hard and soft) of the same for internal and external evaluation.
- Evaluation shall be centered around on novelty, relevance, significance, and impact.
- Additional weightage will be given for submission/publishing of any article type in any journal (University journal or a journal that is indexed in the UGC CARE list/Web of Science/ SCOPUS/SCI/SCIE etc.) or a research proposal.

### Guidelines for Scientific Writing

#### *Research Article*

Presents a full report with new results on a specific topic. Complete experimental details with proper justification. Generally not limited in length, with figures, tables, and references. Format... Title, Authors, Abstract, introduction, experimental, results, discussion, conclusion, acknowledgment, references

#### *Review Articles/Commentary Article*

Gives an overview of research in a particular field. It can be on one's own research or any other topic of general and current interest. Organized differently from communications or research articles as it does not have primary experimental data. Data of existing literature can be presented in a tabular format, graphs, diagrams, figures, charts etc. Should be referenced as thoroughly as possible. Format... Title, Authors, Abstract, introduction, discussion, conclusion, acknowledgment, references

#### *Case Study*

This study represents person, group, or situation that has been studied over time. Format depends upon the type of study.

#### *Monograph*

Title, Author, Introduction: Reason to select a topic; History, timeline, and Scientific/social significance; Benefits to the scientific community, teaching, and research, Development: Exposition of ideas into paragraphs or chapters. "Quote that authors endorse these ideas." Conclusion: Status and future perspectives, References: Should be referenced as thoroughly as possible

#### *Book Chapter*



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# Professional Ethics - Chemistry

Title, Authors, Abstract, Introduction/Background on the topic, Discussion (with subdivisions): Text with tables, figures, charts etc., Summary/Conclusion: Status and future perspectives, References

## **Book Review**

A book review is a thorough description, critical analysis, and/or evaluation of the quality, meaning, and significance of a book, often written in relation to prior research on the topic.

Scope/Purpose/Content, Note the Method/Methodology of writing, Critically Evaluate the Contents, Examine the Front Matter and Back Matter, Summarize and Comment.

## **Research Proposal**

Title, Research Problem/Problem Statement, Rational/Purpose of the Study  
Review of the Literature, Proposed Research Framework, Research Questions/Proposed Hypothesis, Significance, Proposed Methods and Procedures, Deliverables/Expected Outcomes, Execution timelines, year wise breakup, Financial aspects, References

## **References**

- 1 "A Manual for Writers of Research Papers, Theses, and Dissertations", Kate Turabian, University of Chicago Press, 8<sup>th</sup> Edition, 2013.
- 2 "Concise Guide to Writing Research Papers (Perfect Phrases Series)", Carol Ellison, McGraw-Hill Education; 1<sup>st</sup> Edition, 2010.

## **CHE(O) 508 Report Writing**

- ◆ Report Writing for Participation and/or presentation (Poster/Oral/Invited talk as applicable) in University/State level/National/International Seminar/Conference/Webinar/ Symposium/Workshop/Hands-on training /Software learning of at least 2 days. In case of one day seminar/ webinar/ conference/workshop, it is mandatory to participate in two such events.
- ◆ Evaluation will be based on detailed technical report prepared on the conference/seminar/workshop participated and for Poster/Oral presentation, as applicable.
- ◆ Additional weightage will be given for Poster/Oral presentations.

## **Guidelines for Report Writing**



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Professional Ethics - Microbiology

**SEMESTER - VI**  
**COURSE MI-307**  
**Genetic Engineering**

**Unit I Tools of rDNA technology**

1. Fundamentals: rDNA technology, genetic engineering, cloning (1 hr)
2. Enzymes: Restriction endonucleases, Reverse transcriptase, Terminal transferase, Alkaline phosphatase, DNA ligases (3 hr)
3. Cloning vectors (4 hr)
  - A. Criteria for selection of cloning vector
  - B. Types of vector: plasmid vector (pBR322), phage vector ( $\lambda$ ), cosmid, shuttle vector -  $\gamma$ EP and Ti plasmid
4. Genetic probes, primers and reporter genes (Green Fluorescent Protein) (1 hr)
5. Host cell for cloning: properties of good host, prokaryotic and eukaryotic host cells (1 hr)

**Unit II Techniques for genetic engineering**

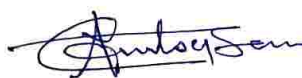
Principle, method and applications of following techniques

1. Gene editing: Site directed Mutagenesis (2 hr)
2. Gene amplification: Polymerase Chain Reaction (2 hr)
3. Gene detection by hybridization: Southern blotting (2 hr)
4. Gene sequencing: Sanger's dideoxy chain termination method (2 hr)
5. Gene expression: DNA microarray (2 hr)

**Unit III rDNA technology**

1. Obtaining desired DNA fragment: Isolation from donor cell – shot gun cloning and construction of genomic library, construction of cDNA library, chemical synthesis of DNA (4 hr)
2. Preparation of rDNA: Protocol for joining isolated DNA fragment with cloning vector (2 hr)
3. Transfer of rDNA in to suitable host cell: Transformation, Gene gun, Microinjection, Protoplast Fusion, and Electroporation. (2 hr)
4. Selection of recombinant clone: Colony hybridization technique, Use of marker genes, X- gal dye and reporter gene (2 hr)



  
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# Microbiology

## Unit IV Applications of rDNA technology

1. Medical applications: Recombinant vaccine (Hepatitis-B), Recombinant protein (Insulin) (4 hr)
2. Agricultural applications: Transgenic plants resistant to microbial pathogens & insect pests (4 hr)
3. Environmental applications: Environmental genomics - metagenomics (1 hr)
- ✓ 4. Social impacts of rDNA technology (ELSI) Ethical Legal and Social Implications (1 hr)

### Reference Books:

1. Prescott, Harley, and Klein's Microbiology, J. M. Willey, L. M. Sherwood, C. J. Woolverton, 7<sup>th</sup> Edition (2008), McGraw Hill Higher Education- USA
2. Principles of Microbiology, R. M. Atlas, 2<sup>nd</sup> Edition (Indian Edition) (2015), McGraw Hill Education (India) Private Limited -New Delhi
3. Biotechnology: The Biological Principles, Trevan M. D., Boffey S., Goulding K. H. and Stanbury S. (1987) Tata - McGraw Hill, New Delhi - India.
4. Biotechnology, U. Satyanarayana, 1<sup>st</sup> Edition (Reprinted 2008), Books and Allied (P) Ltd. Kolkata



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**GUJARAT UNIVERSITY**  
**B.Sc. Elective /B.Com Soft Skill/ B.A Soft Skill**  
**Semester – II**  
**(Effective from Jul 2021)**

**National Cadet Corps: (2 + 1 Credit) (NCC)**

**Professional Ethics**

**Unit-I:**

**INTRODUCTION TO MAP READING:**

Definition of Map, Conventional Signs, Scales and Grid System, Methods of Expressing a Scale, Definition of Grid and Grid Lines, Topographical Forms and Technical Terms, Relief Contours and Gradients, Cardinal points and types of north.

**Unit-II:**

**CIVIL DEFENCE AND DISASTER MANAGEMENT:**

Introduction, National Disaster Management Authority (NDMA), Organisation of NDMA, National Disaster Response Force (NDRF), Types of Disasters, Classification of Disasters, Essential Services and their Maintenance, Types of Maintenance Required for Essential Services, Role of NCC Cadets in Maintaining Essential Services, Employment of NCC Cadets during Natural Disasters, Effects of Natural Disasters, Types of Assistance Required, Assistance by NCC during Natural Disasters, Method of Providing NCC Assistance, Civil Defence Services and their Duties.

**Unit-III:**

**NATURAL - MAN MADE DISASTERS AND FIRE SERVICES:**

Introduction, Precautionary Measures to be followed by NCC Cadets, Floods, Tsunami, Earthquakes, Accidents.

Introduction, Causes and Prevention of Fire, Prevention of Fire, Fire Fighting, Fire Fighting Parties, Fire Fighting Equipments.

**Unit-IV:**

**HYGIENE, SANITATION AND FIRST AID:**


Introduction, Personal Hygiene, Food Hygiene and Camp Hygiene.

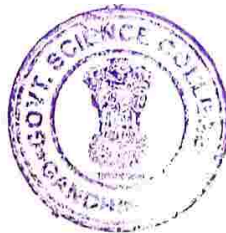
Introduction; Injuries to Internal Organs; Snake, Scorpion and Dog Bite; Asphyxia; First Aid for different type of fractures; Treatment and care of Wounds.

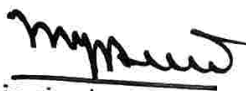
**Text Book:** NCC Cadet's Hand Book (Specialised Subjects) SD/SW (Year: 2019) Unit: 1

NCC Cadet's Hand Book (Common Subjects) SD/SW (Year: 2019) Unit: 2, 3, 4

**Ref. Book:** NCC Cadet Handbook

  
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GUJARAT UNIVERSITY  
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Semester – IV  
(Effective from Jul 2021)  
National Cadet Corps: (2 + 1 Credit)

**Unit-I:**

**INTRODUCTION TO FIELD CRAFT AND BATTLE CRAFT:**

Introduction, Field Craft and Battle Craft, Judging Distance, Practical Hints. Indication of Landmarks and Targets: Introduction, Definitions, Types of Ground, Indication of Landmarks, Methods of Indication Targets, Observation, Camouflage and Concealment: Introduction, Camouflage, Concealment.

**Unit-II:**

**ADVENTURE ACTIVITIES, KNOTS, LASHINGS AND STRETCHERS:**

Parasailing, Slithering, Rock Climbing, cycling and Trekking, Knots: Knots for Rope ends or for Grips on Thin Rope, Knots for Joining Ropes, Knots to make loops in Rope, Knots for fastening ropes. Lashings: Square Lashings and Frapping Turns, Stretchers: Basic, Wheeled and other types of stretchers

**Unit-III:**

**PE SOCIAL SERVICE:**

Basics of Social Service, Rural Development Objectives, Important Rural Development Programmes, Non-Government Organisations (NGOs), Contribution of NGOs, Contribution of Youth, Role of NCC.

**Unit-IV :**

**E WATER AND ENERGY CONSERVATION:**

Water Conservation: Introduction, Ways to Conserve Water Indoors, Other practices for water conservation, Rain water Harvesting, Types of Rainwater Harvesting Systems.

Energy Conservation: Introduction. Energy Conservation Measures.

**Text Book:** NCC Cadet's Hand Book (Specialised Subjects) SD/SW (Year: 2019) Unit: 1, 2

NCC Cadet's Hand Book (Common Subjects) SD/SW (Year: 2019) Unit: 2, 3, 4

**Ref. Book:** NCC Cadet Handbook



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GENDER - CWDC

**GOVERNMENT SCIENCE COLLEGE  
GANDHINAGAR**

**Activities Conducted by CWDC  
Academic Year 2022-2023: June 2022 to May 2023**

Title of the Activities Conducted by CWDC	Organising unit/ agency/ collaborating agency	Number of teachers co-ordinated such activities	Number of Girls students participated in such activities
Legal Education Camp related to women. Dt. 3/9/2022	CWDC and Gandhinagar District law and Service Association	7	150
Orientation and Awareness Programm on POCSO Act. Dt. 7/10/2022	NSS, CWDC and Gandhinagar District law and Service Association	5	53 Girls and 84 Boys
Celebration of Constitution day Dt. 26/11/2022	Nehru Yuva kendra, NSS and CWDC	4	21 Girls and 50 Boys
Essay writing, Story writing and self composed poetry recitation Competition	Saptdhara, CWDC	6	11 Girls and 4 Boys
Women's Health Awareness Talk	CWDC	7	About 100

*Heena Prajapati*

Chairman of CWDC: Dr. Heena Prajapati

*Myra*

Principal  
Govt. Science College  
Gandhinagar



## GOVERNMENT SCIENCE COLLEGE GANDHINAGAR

Activities Conducted by CWDC  
Academic Year 2021-2022: June 2021 to May 2022

Title of the Activities Conducted by CWDC	Organizing unit/ agency/ collaborating agency	Number of teachers co-Ordinated such activities	Number of Girl students participated in such activities
A workshop on cake making	CWDC	6	35
A training programme on paper quelling art	CWDC	6	40
Drawing competition on international daughter's day celebration	CWDC/ Saptdhara	4	12
Women's health awareness programme	CWDC	6	50
Self defense programme	CWDC	6	60

*Mrs*  
(Dr. K. S. Nirmalvat)  
co-ordinator  
CWDC



*M. S. Nirmalvat*  
Principal  
Govt. Science College  
Gandhinagar



## GOVERNMENT SCIENCE COLLEGE GANDHINAGAR

**Activities Conducted by CWDC  
Academic Year 2020-2021: June 2020 to May 2021**

Title of the Activities Conducted by CWDC	Organizing unit/ agency/ collaborating agency	Number of teachers co-Ordinated such activities	Number of Girl students participated in such activities
A webinar on girl child education and POCSO ACT ON NATIONAL GIRL CHILD DAY	CWDC/NSS	2	375
Rangoli Competition on Save girl child- Educate girl child	CWDC/Saptdhara	6	10
Salad making competition	CWDC	3	6
Attended the programme celebrating women's innovation and start up on international women's day at kCG	CWDC	3	16
International women's day celebration by conducting Webinar on Save girl child.	CWDC/NSS	2	150



*Mss*  
C Dr. R.S. Nimurut  
CO-ordinator  
CWDC

*Mysuru*  
Principal  
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# GOVERNMENT SCIENCE COLLEGE GANDHINAGAR

Activities Conducted by CWDC  
Academic Year 2019-20: June 2019 to May 2020

Title of the Activities Conducted by CWDC	Organizing unit/ agency/ collaborating agency	Number of teachers co-Ordinated such activities	Number of Girl students participated in such activities
Seminar on awareness of women's health	CWDC	7	130
Seminar on Motivation of girl's education and awareness of law and important helpline numbers related to women's safety	CWDC	6	100
A 5 days physical training programme on self defense of girl	CWDC	4	60
Poster Making Competition On "Beti Bachao - Beti Padhao" Theme	CWDC and Saptdhara committee -	7	10



*M.S.*  
CDR K.S. Nimavat  
CO - Ordinator  
CWDC

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## GOVERNMENT SCIENCE COLLEGE GANDHINAGAR

**Activities Conducted by CWDC  
Academic Year 2018-19: June 2018 to May 2019**

Title of the Activities Conducted by CWDC	Organizing unit/ agency/ collaborating agency	Number of teachers co-ordinate such activities	Number of students participated in such activities(110)	
			Girls	Boys
Seminar on how to develop self confidence and get rid of depression , use of CCTV camera for security	CWDC	5	45	65



*NS*  
CO-ordinator  
(Dr. K. S. Nirmavut)  
CWDC

*Mysant*  
Principal  
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Human Values -NSS

**Government science College, Gandhinagar**  
**NSS activities Summary 2022-23**

Name of Activity	Organising unit/ agency/ collaborating agency	Name o the scheme	Year o the activity	Number of students participated in such activities
World Bicycle Day	NSS Unit & NYK, Gandhinagar	Health and Environment Awareness	2022	20
Safety Kit Distribution	NSS Unit & Gandhinagar district Indian Redc	Hygine Awareness	2022	10
Piantation	NSS Unit & ECO Club	Environment Awareness	2022	50
Plastic free campaign	NSS Unit & ECO Club	Environmental Awareness	2022	40
Yuva Matdar Mohotsav-2022 programme & Electoral Enrolment Camp	NSS Unit & 36- Deputy Mamlatdar of Gandhinagar North Constituency	Election Awareness	2022	250
Blood Donation Camp and Organ Donation Oath	NSS Unit & Gandhinagar district Indian Redcross Society	Social Welfare	2022	300
POCSO Act-2012 Awareness	NSS Unit	Social Welfare	2022	137
Indian Constitution Day	NSS Unit	Democracy Awareness	2022	58
National Youth Day	NSS Unit & NYK, Gandhinagar	Youth Awareness	2023	60
Save the Birds	NSS Unit & Animal Husbandry Department	Nature Awareness	2023	6
Blood Donation Camp at Rajbhavan	Rajbhavan, Gandhinagar	Social Welfare	2023	30
Writer for Blind Students	NSS Unit	Welfare for Physically disabled students	2023	11
Drug Free India	Art of Living and Gujarat Technological Unive	Say Yes to Life, No to Drug	2023	65
Martyr's Day	NSS Unit	Freedom fighter Awareness	2023	10



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## Human Values - NSS



### Government Science College, Gandhinagar NSS activities Summary 2021-22

Name of Activity	Organising authority or its collaborating agency	Name of the scheme	Year of the activity	Number of students participated in such activities
1. COVID Vaccination and Election Awareness	NSS Unit	Pandemic & Election Awareness	2021	120
2. Plantation	NSS Unit	Green Campus	2021	95
3. FIT INDIA RUN	NSS Unit & NYK Gandhinagar	Campaign Programme Healthy India	2021	90
4. Constitutional Day	NSS Unit	Under theme of Azadi Ka Amrit Mahotsav	2021	130
5. Polo Forest Visit	NSS Unit & Communication Division, Forest Department Gujarat State	Nature Education	2021	100
6. Safety Kit Distribution	NSS Unit & Gandhinagar district Redcross Society	Hygiene Awareness	2022	30
7. YOGA On Swami Vivekanand Jayanti	NSS Unit, Gymkhana Committee & Manas Seva Trust	Health Awareness	2022	70
8. Me Bhi Subhash	NSS Unit & Nehru Youva Kendra, Gandhinagar	Acknowledge to freedom fighter	2022	35
9. Online Pledge on Say Yes to Life, No to Drug	NSS Unit	Say Yes to Life, No to Drug	2022	120
10. Pulse Polio Vaccination	NSS Unit, Red Cross Society Gandhinagar and Municipal Corporation Gandhinagar	Social Welfare	2022	20
11. Writer for Blind Students	NSS Unit	Welfare for Physically disabled students	2022	40
12. Plastic Free Cleanliness Drive	NSS Unit, REDCROSS Society, Gandhinagar and Nature First, Gandhinagar	Environmental Awareness	2022	32
13. Science Talk and Laboratory visit	NSS Unit & Nisarg Community Science Centre Gandhinagar	Science Awareness	2022	115
14. Cleanliness	NSS Unit	NSS Special Camp	2022	50
15. Benefits of Cycling	NSS Unit	NSS Special Camp	2022	50
16. Cow Adharit Kheta	NSS Unit	NSS Special Camp	2022	50
17. Vaccination Awareness Survey	NSS Unit	NSS Special Camp	2022	50
18. First Aid Training	NSS Unit & Red Cross Society Gandhinagar	NSS Special Camp	2022	50
19. Save Water Awareness Rally	NSS Unit	NSS Special Camp	2022	50
20. Sports activity for primary students under FIT INDIA theme	NSS Unit	NSS Special Camp	2022	50



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Human Values - NSS



Government science College, Gandhinagar  
NSS activities Summary 2020-21

	Name of Activity	Organising unit/ agency/ collaborating agency	Name o the scheme	Year o the activity	Number o students participated in such activities
1	Chief Minister's Relief Fund Appeal	NSS Unit	National Service Scheme	2020	200
2	Social Distancing Awareness and COVID-19 Prevention through YouTube Videos	NSS Unit	COVID-19 Prevention	2020	93
3	An uplifting message	NSS Unit	COVID-19 Awareness	2020	33
4	Online training course for CORANA COMMANDO (GUJARATI)	Surat Municipal Corporation and Social Work Team Charitable Trust Surat	Social Welfare	2020	37
5	Online training course for COVID-19 COMBATANT	Vinayak Mission Research Foundation	Social Welfare	2020	37
6	Plantation	NSS Unit & Happy Youth Club, Gandhinagar	Environmental Awareness	2020	15
7	E-waste collection	Nisarga Community Science Centre, Sector-23 Gandhinagar	Environmental Awareness	2020	7
8	Webinar held on Constitution Day	NSS Unit	Democracy Awareness	2020	167
9	Electoral roll revision camp	NSS Unit & Provincial Office Gandhinagar	Election Awareness Campagian	2021	15
10	Pulse Polio Day	NSS Unit, Red Cross Society Gandhinagar and Municipal Corporation Gandhinagar	Social Welfare	2021	16
11	Traffic Awareness and Road Safety	NSS Unit	Road Safety Week	2021	20
12	Plastic Free Blogging Run	NSS Unit, Nisarga Community Science Centre, Gandhinagar and Municipal Corporation, Gandhinagar	Environmental Awareness	2021	100



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## Human Values - NSS



Government science College, Gandhinagar

### NSS activities Summary 2019-20

	Name of Activity	Organising unit, agencies collaborating agencies	Name of the scheme	Year of the activity	Number of students participate
1	Save Water Awareness Rally & Exhibition	NSS Unit	Environmental Awareness	2019	400
2	Plantation	NSS Unit	Environmental Awareness	2019	110
3	Fit India Movement	NSS Unit	Fit India	2019	300
4	Food awareness seminar	NSS Unit	Health Awareness	2019	260
5	Environment Awareness seminar	NSS Unit & Nsang Science Centre Gandhinagar	Environmental Awareness	2019	250
6	Cyber Security Awareness seminar	NSS Unit & District Police Department, GTU, Ahmedabad	cyber crime prevention	2019	260
7	Run for Plastic free	NSS Unit	Cleanliness Awareness	2019	70
8	Uhalasema checkup	NSS Unit & District Redcross Society, Ahmedabad	Health Awareness	2019	380
9	Constitutional Day celebration	NSS Unit	Democracy Awareness	2019	70
10	National Voter's Day	NSS Unit & State Election Commission of Gujarat	Election Awareness	2020	100
11	Heartfulness Essay competition	NSS Unit, Shree Ramchandra Mission & Heartfulness Institute, Adalaj	Writing skill development	2020	1162
12	Cleanliness	NSS Unit	Cleanliness Awareness	2020	43
13	Cleanliness Awareness Rally	NSS Unit	Cleanliness Awareness	2020	43
14	Cleanliness Awareness Lecture Session	NSS Unit	Cleanliness Awareness	2020	45
15	Slogan Writing	NSS Unit	Cleanliness Awareness	2020	36
16	Dustbin making Program	NSS Unit	Cleanliness Awareness	2020	30
17	Drama on Cleanliness theme	NSS Unit	Cleanliness Awareness	2020	45
18	Carbon Foot print survey of Por Village of Gandhinagar District	NSS Unit	Environmental Awareness	2020	53
19	Superstition Prevention	NSS Unit & Nsang Science Centre Gandhinagar	Social awareness	2020	53
20	Health & Diabetic Check-up camp at Por	NSS Unit & Redcross society, Gandhinagar District Branch	Health Awareness	2020	53
21	Blood Donation Camp	NSS Unit & Redcross society, Gandhinagar District Branch	Social Welfare	2020	16
22	Lake cleaning at Por Village	NSS Unit	Cleanliness Awareness	2020	20
23	First Aid Training	NSS Unit & Redcross society, Gandhinagar District Branch	Self Safety Awareness	2020	30
24	Hot cloth Distribution to needy	NSS Unit	Social Welfare	2020	45
25	Dust bin making at Por Village	NSS Unit	Cleanliness Awareness	2020	30
26	Traffic Awareness	NSS Unit	Road Safety Awareness	2020	20
27	Meditation and Yoga	NSS Unit & Shree Ramchandra Mission, Adalaj	Fit India	2020	53
28	2 level NSS Program, Gujarat State	NSS Unit & NSS Cell, Gujarat State	Training for RO	2020	15



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Human Values - NSS



Government science College, Gandhinagar  
NSS activities Summary 2018-19

	Name of Activity	Organising unit/ agency/ collaborating agency	Name o the scheme	Year o the activity	Number of students participated in such activities
1	Plantation	NSS Unit & Vanshree Trust Gandhinagar	Environmental Awareness	2018	50
2	Cancer Awareness Seminar	NSS Unit & Lions Club Gandhinagar	Health Awareness	2018	100
3	Gandhi Jayanti	NSS Unit	Cleanliness Awareness	2018	200
4	Thalassemia checkup	NSS Unit & District Redcross Society, Ahmedabad	Health Awareness	2018	355
5	Gandhinagar District Youth Parliament	NSS Unit & NSS Regional Office Ahmedabad	Youth Awareness	2019	47
6	Tribute to the martyrs of the terrorist attack at Pulvama	NSS Unit	Tribute to the martyrs	2019	300
7	VOTER ELECTORAL ENROLMENT PROGRAM	NSS Unit & Assistant Electoral Registration officer, 35- Gandhinagar South LAC.	Election Awareness	2019	50
8	Child marriage Prevention Rally	NSS Unit & District Child Protection Office Gandhinagar	Social Awareness	2019	50
9	Mock Youth Parliament	NSS Unit	Democracy Awareness	2019	50



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Human Values - NCC

3. Human Values through NCC 2022-23					
Sr No	Specials Days/Events	Date	Activity	No of Participants	Place of Event
1	Constitution Day	11/26/2022	Pledge Taking	40	NCC Unit
2	Gandhi Jayanti	02/10/2022 & 16/07/2022	Cleanliness Drive and Nukkad natak	35	Central Vista and Borij Village
3	Indian Coast Guard Day	2/1/2023	Sabarmati Cleaning Drive	30	Sabarmati River front
4	Shahid Diwas	2/14/2023	Black Day Event	35	NCC Unit
5	Environmental Awareness Programme	3/22/2023	Poster Making on Save Water	35	NCC Unit
6	Environmental Awareness Programme	7/2/2022	Tree Plantation	30	River Front A'bad



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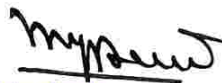


**↓ List of Activities and  
Participation of Cadets-2021-22**

<b>Sr No</b>	<b>Activity/Camp</b>	<b>No of Participati on</b>	<b>Place of Activity</b>
01	International Day of Yoga	43 cdts	Unit/Home
02	Tree Plantation	43 cdts	Home/Unit
03	Kargil Vijay Diwas 2021: Kargil Ke Veero ko Gujarat Ka Aabhar Theme	43 cdts	Mahatma Mandir
05	Rank Ceremony 2021	10 cdts	Unit
06	71 <sup>st</sup> Vanmahotsav	30 cdts	Forest Dept
07	Independence Day 2021	50 cdts	District/ Instt
08	International Coastal Clean Up Day 2021	30 cdts	Sabarmati
09	AP National Trekking Camp	05 cdts	Andhra Pradesh
10	Republic Day 2022	35 cdts	Instt
11	NCC Raising Day 2021	15 cdts	Unit
12	World Environment Day	30 cdts	Mahatma Mandir
13	World Health Day	30 cdts	GSCGNR
14	World Sparrow Day	30 cdts	Sec-20
15	World Water Day	30 cdts	Sec-20
16	International Women's Day	20 cdts	Unit
17	Shahid Diwas: Shahido ko Naman	20 cdts	Sec-26 Public Garden

  
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(Pg. 01/02)

18	Say No to Drugs Pledge Drive	50 cdt	Online
19	Swarnim Vijay Diwas	30 cdt	Unit
20	CATC Camp	40 cdt	Grp Hq
21	EBSB Camp	04 cdt	Online
22	Maharashtra Trek Camp	02 cdt	Maharashtra
23	National Flag Day	15 cdt	Unit
24	National Constitution Day	15 cdt	Unit
25	Fire and Safety Workshop	30 cdt	Instt
26	All India NCC Alumni Association Registration	52 cdt	Online
27	Electoral Voter Awareness	30 cdt	Unit
28	'C' Certificate Exam	19 cdt	GRP HQ
29	'B' Certificate Exam	17 cdt	GRP HQ
30	Narmada Trek Camp	01 cdt	1 Guj Bn
31	Republic Day Parade	03 cdt (1 Navy Recruit)	New Delhi

*A.N.O.*

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*Mysant*


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(Pg. 02/102)




**NCC Activities during year 2020-21**

1. **Aatma Nirbhar Awareness Campaign** was organized by NCC HQ and 3 cadets participated in online camp. 60 cadets took online pledge through MyGov portal.
2. 1 Cadet participated in online **SSB Coaching Camp**. (Cdt Hitesh Chaudhary)
3. **Kargil Vijay Diwas** on 26/07/2020 was Celebrated online through webinar organized by NCC HQ. 48 cadets participated in this webinar.
4. Online **EBSB Camp** was organized from 26/06/2020 to 05/07/2020, one cadet participated in the camp. (Cdt Dhrumil Thripathi)
5. **Blood Donation Camp** was organized by 2 Guj (I) Coy and 05 cadets donated their blood in this camp.
6. **A webinar on New Education policy** was organized by Gp Hq, 01 cadet from our institution participated in this webinar in October 2020.
7. **'Tree Plantation at Home'** activity was given to the cadets and 48 cadets planted trees in their nearby surroundings.
8. **'International Day of Yoga'** on 21<sup>st</sup> June 2020 was celebrated by the cadets from home. 30 cadets actively participated in Yoga Day celebration.
9. **74<sup>th</sup> Independence Day** was celebrated in the institution and as per strict guide lines of Govt the celebration was concluded in 15 mins with proper social distancing.
10. **Enrollment process** for First Year was Completed in January with Physical Test and Theory Test. 22 new cadets are enrolled in NCC by the Institution.
11. **72<sup>nd</sup> Republic day of India** was celebrated with active participation of the cadets in the institution under guild lines of Government.
12. An awareness activity on **'Constitution Duties Awareness'** theme was organized by 2 Gujarat Indep Coy and 05 cadets from our institution participated in this activity.
13. 05 cadets from institution were sent for the selection procedure of RDC year 2021.
14. An **activity on subject of Anti-corruption** was done online and appx 28 cadets participated in the activity.

  
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Cd. 02/10/21



15. **CATC camp** was organized by 2 Guj (I) Coy, Gandhinagar from 15<sup>th</sup> February to 19<sup>th</sup> February 2021. In this 5 day's camp 38 cadets from our institution participated actively which was necessary for their up coming 'B' and 'C' Certificate Exams.

16. 11 cadets from our institution will appear this year in 'C' Certificate Exam, and 27 cadets from second year will appear in 'B' certificate exam.



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C Pg. 02/02.



(6)  
**Environment and Sustainability,**  
**Government Science College, Gandhinagar**

Eco club

**Eco Club Activity Report**

Academic Year 2022-23 : June 2022 To May 2023

Sr.No.	Name of the Activities Conducted By Eco Club	Organizing Unit/Agency/Collaborating Agency	No. of Students
1	Environment Day Celebration - Making seedball and Plantation Programme	Eco Club / Geer Foundation	20
2	"Feets on Street" A Step towards Sustainable Future	Municipal Corporation & Biofix Private Limited/Eco Club	7
3	Plantation Programme at College	NSS / Eco Club	15
4	"International Nature Conservation Day" Celebration	Eco Club /NSS	45
5	"International Tiger Day" Celebration	Eco Club, Botany Department	10
6	Quiz on "World Lion Day" Celebration	Eco Club	40
7	Van Mahotsav - Taluka level	Forest Dept.& Mahanagar Palika/Eco Club	20
8	"Eco Friendly Ganesha Idol Making"	Eco Club/Geer Foundation	22
9	International Seminar on "Some State-of-the-Art Practices in Biological Science.	Gujarat Arts and Science College, Ahmedabad/Eco Club, Botany Department	6
10	Slogan Competition on Environment and Biodiversity	Eco Club	90
11	Wild life Week Celebration-Students opinion about Wild Life and Nature Conservation.	Eco Club	14
12	Wild life Week Celebration-Quiz on Biodiversity	Eco Club	25
13	Wild life Week Celebration-Bird Watching Programme	Eco Club/Geer Foundation	18
14	Wild life Week Celebration - Drawing Competition on Wild Life Conservation	Eco Club	10
15	Wild life Week Celebration - Snake Bite Awareness Lecture	Eco Club/Geer Foundation	14
16	Wild life Week Celebration-Wild Life of Gujarat	Eco Club	30
17	Wild life Week Celebration-Elocution Competition on "Forest our Best Friends"	Eco Club	8
18	Wild life Week Celebration - Certificate Programme	Vanshree/Eco Club	5
19	Kitchen garden and Apiculture Programme	Urban Horticulture Development Centre, Gandhinagar/Eco Club	60
20	Eco Club Project Work on Save Earth	Eco Club	2
21	World Wild Life Day Celebration by Poster Making Event	Eco Club	5
22	World Sparrow Day Celebration making Sparrow Nest	Eco Club	15
23	World Forest Day Celebration - medicinal and ornamental Plantation in Pot programme	Eco Club	15
24	World Water Day Celebration -Poster Making Competition	Eco Club	10
25	Terrarium Plants and Seed Making By Students	Eco Club	10
26	Organic Workshop	Eco Club/Geer Foundation	10
27	"International Earth Day" Celebration	Eco Club/Geer Foundation	12



**Chairman**  
**Pipal Eco Club**  
**Government Science College,**  
**Gandhinagar**

**Head**  
**Department of Botany**  
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**Gandhinagar**

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**Govt. Science College**  
**Gandhinagar**

**Government Science College, Gandhinagar  
Eco Club Activity Report**

Academic Year 2021-22 : June 2021 To May 2022			
Sr. No.	Name of the Activities Conducted By Eco Club	Organizing Unit/Agency/Collaborating Agency	No. Of Students
1	Environment Day Celebration - Plantation Programme	Eco Club	20
2	Green Campus Development - Plantation Programme	NSS/Eco Club	20
3	Webinar on "Indian Herbal Heritage and Importance of Medicinal Plants"	Eco Club, Botany Department	60
4	Botany Students Attended Naure Camp	Eco Club, Botany Department	13
5	Guest Lecture on "Kitchen Garden"	Eco Club, Botany Department	23
6	"Introduce new Cactus Garden"	Eco Club, Botany Department	15
7	MOU with Horticulture Department, Krishibhavan, Gandhinagar	Eco Club, Botany Department	5
8	Drawing Competition on "World Wild Life Day" Celebration	Eco Club	7
9	Students Participated "World Sparrow Day" Celebration Programme at Indroda park, Gandhinagar, Gujarat.	Gujcost-Geer Foundation/Eco Club	31
10	Drawing Competition on "World Forest Day" Celebration	Eco Club	10
11	Drawing Competition on "World Water Day" Celebration	Eco Club	6

  
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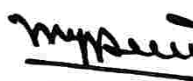


**Government Science College, Gandhinagar**  
**Eco Club Activity Report**  
Academic Year 2020-21 : June 2020 To May 2021

Sr. No.	Name of the Activities Conducted By Eco Club	Organizing Unit/Agency/Collaborating Agency	No. Of Students
1	Plantation Programme	GMPB/Eco Club	15
2	Poster making Competition on "save Environment" Theme	Eco Club /Saptdhara	15
3	Clay modeling Workshop on Eco friendly Ganesha	Eco Club /Saptdhara	30

  
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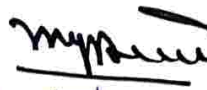


**Government Science College, Gandhinagar**  
**Eco Club Activity Report**  
Academic Year 2019-20 : June 2019 To May 2020

Sr. No.	Name of the Activities Conducted By Eco Club	Organizing Unit/Agency/Collaborating Agency	No. of Students
1	Students of Botany Department have actively participated Nature camp, Aranya park, Gujarat Ecological Education and research foundation, Gandhinagar.	Eco Club , Botany Department	49
2	Students of Eco Club, Botany Department have visited Jambughoda forest as a part of Curicullum.	Eco Club , Botany Department	34

  
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**Government Science College, Gandhinagar**  
**Nature Club/Eco Club Activity Report**  
**Academic Year 2018-19 : June 2018 To May 2019**

Sr. No.	Name of the Activities Conducted By Eco Club	Organizing Unit/Agency/Collaborating Agency	No. Of Students
1	B.Sc Sem 6 Botany students Paper Presented in Science Excellence,2018, Dept. of Botany, Gujarat University	Nature Club, Botany/ Department and Gujarat University	8
2	B.Sc Sem 6 Botany students Visited Waghai Botanical Garden, Gira Fall, Tribal Museum in Saputara and also visited Dandi Smarak in Navasari as a part of Educational Tour.	Nature Club, Botany Department	20
3	B.Sc Sem 6 Botany students Participated National Workshop on Mangrove coservation, Mahatma Mandir, Gandhinagar, Gujarat	Nature Club, Botany Department	5

  
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**Gandhinagar**





Project Report / Field work  
Botany

GOVERNMENT SCIENCE COLLEGE, GANDHINAGAR

BOTANY DEPARTMENT

2022-23

Sr. No	Enrollment No.	Full Name	Programme Name	Title	Field Work equivalent to Tour Report/Nursery Report
1	202002102926	CHAUDHARY ALPESHBHAI VIRABHAI	B.SC SEM 5	Pavagadh Forest	Tour Report
2	202002102928	CHAUDHARY APILBHAI GOVABHAI	B.SC SEM 5	Pavagadh Forest	Tour Report
3	202002104798	PUNADIYA DHAVALKUMAR SHANTILAL	B.SC SEM 5	Pavagadh Forest	Tour Report
4	202002102696	AHIR LAKHMAN DEVRAJ	B.SC SEM 5	Pavagadh Forest	Tour Report
5	202002102958	CHAUHAN NIRALIKUMARI JAGATSINH	B.SC SEM 5	Pavagadh Forest	Tour Report
6	202002102988	DAMOR NITINKUMAR LALUBHAI	B.SC SEM 5	Pavagadh Forest	Tour Report
7	202002103309	PRAJAPATI PANKTIBEN BHANUBHAI	B.SC SEM 5	Pavagadh Forest	Tour Report
8	202002103417	VADSARA RIYA MUKESHBHAI	B.SC SEM 5	Pavagadh Forest	Tour Report
9	202002103067	KATARA ROHITBHAI BABUBHAI	B.SC SEM 5	Pavagadh Forest	Tour Report
10	202002102961	CHAUHAN TUSHARSINH DHARMENDRASINH	B.SC SEM 5	Pavagadh Forest	Tour Report
11	202002103385	SONI UDAY MUKESHKUMAR	B.SC SEM 5	Pavagadh Forest	Tour Report
12	202002103032	HUMBAL VAIDIK SUBHASHBHAI	B.SC SEM 5	Pavagadh Forest	Tour Report
13	202002103433	VAGHELA VISHALSINH LALSINH	B.SC SEM 5	Pavagadh Forest	Tour Report
14	202002103303	PRAJAPATI KHUSHI VIJAYKUMAR	B.SC SEM 5	Pavagadh Forest	Tour Report
15	202002103389	SUTHAR NAVINKUMAR DINESHJI	B.SC SEM 5	Pavagadh Forest	Tour Report
16	202002102732	CHAVDA CHHAYABEN PRAVINSINH	B.SC SEM 5	Pavagadh Forest	Tour Report
17	202002103302	PRAJAPATI JYOTI SHIVCHARAN	B.SC SEM 5	Indroda Nature Park, Gandhinagar	Tour Report
18	202002103136	PADSUMBIYA KINJAL HEMANTBHAI	B.SC SEM 5	Indroda Nature Park, Gandhinagar	Tour Report
19	202002102987	DAMOR MEHULBHAI SANJAYBHAI	B.SC SEM 5	Indroda Nature Park, Gandhinagar	Tour Report
20	202002102912	CHAUDHARI MITTALBEN DINESHKUMAR	B.SC SEM 5	Indroda Nature Park, Gandhinagar	Tour Report
21	202002103325	RAIYANI PRIYANK CHANDUBHAI	B.SC SEM 5	Indroda Nature Park, Gandhinagar	Tour Report
22	202002103124	MORADIYA YASH AKHILBHAI	B.SC SEM 5	Indroda Nature Park, Gandhinagar	Tour Report
23	202002102732	CHAVDA CHHAYABEN PRAVINSINH	B.SC SEM 5	Indroda Nature Park, Gandhinagar	Tour Report
24	202002103309	PRAJAPATI PANKTIBEN BHANUBHAI	B.SC SEM 5	Indroda Nature Park, Gandhinagar	Tour Report
25	202002102926	CHAUDHARY ALPESHBHAI VIRABHAI	B.SC SEM 6	Pavagadh Forest	Tour Report
26	202002102928	CHAUDHARY APILBHAI GOVABHAI	B.SC SEM 6	Anand Farm and Nursery, Gandhinagar	Nursery Report
27	202002102732	CHAVDA CHHAYABEN PRAVINSINH	B.SC SEM 6	Anand Farm and Nursery, Gandhinagar	Nursery Report
28	202002104798	PUNADIYA DHAVALKUMAR SHANTILAL	B.SC SEM 6	Anand Farm and Nursery, Gandhinagar	Nursery Report
29	202002103302	PRAJAPATI JYOTI SHIVCHARAN	B.SC SEM 6	Anand Farm and Nursery, Gandhinagar	Nursery Report
30	202002103303	PRAJAPATI KHUSHI VIJAYKUMAR	B.SC SEM 6	Anand Farm and Nursery, Gandhinagar	Nursery Report
31	202002103136	PADSUMBIYA KINJAL HEMANTBHAI	B.SC SEM 6	Anand Farm and Nursery, Gandhinagar	Nursery Report
32	202002102696	AHIR LAKHMAN DEVRAJ	B.SC SEM 6	Anand Farm and Nursery, Gandhinagar	Nursery Report
33	202002102987	DAMOR MEHULBHAI SANJAYBHAI	B.SC SEM 6	Anand Farm and Nursery, Gandhinagar	Nursery Report
34	202002102912	CHAUDHARI MITTALBEN DINESHKUMAR	B.SC SEM 6	Anand Farm and Nursery, Gandhinagar	Nursery Report
35	202002103389	SUTHAR NAVINKUMAR DINESHJI	B.SC SEM 6	Anand Farm and Nursery, Gandhinagar	Nursery Report
36	202002102958	CHAUHAN NIRALIKUMARI JAGATSINH	B.SC SEM 6	Anand Farm and Nursery, Gandhinagar	Nursery Report
37	202002102988	DAMOR NITINKUMAR LALUBHAI	B.SC SEM 6	Anand Farm and Nursery, Gandhinagar	Nursery Report
38	202002103309	PRAJAPATI PANKTIBEN BHANUBHAI	B.SC SEM 6	Anand Farm and Nursery, Gandhinagar	Nursery Report
39	202002103325	RAIYANI PRIYANK CHANDUBHAI	B.SC SEM 6	Anand Farm and Nursery, Gandhinagar	Nursery Report
40	202002103417	VADSARA RIYA MUKESHBHAI	B.SC SEM 6	Anand Farm and Nursery, Gandhinagar	Nursery Report
41	202002103067	KATARA ROHITBHAI BABUBHAI	B.SC SEM 6	Anand Farm and Nursery, Gandhinagar	Nursery Report
42	202002102961	CHAUHAN TUSHARSINH DHARMENDRASINH	B.SC SEM 6	Anand Farm and Nursery, Gandhinagar	Nursery Report
43	202002103385	SONI UDAY MUKESHKUMAR	B.SC SEM 6	Anand Farm and Nursery, Gandhinagar	Nursery Report



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Enrollment No.	Full Name	Programme Name	Title	Field Work equivalent to Tour Report/Nursery Report	
44	202002103032	HUMBAL VAIDIK SUBHASHBHAI	B.SC SEM 6	Anand Farm and Nursery, Gandhinagar	Nursey Report
45	202002103433	VAGHELA VISHALSINH LALSINH	B.SC SEM 6	Anand Farm and Nursery, Gandhinagar	Nursey Report
46	202002103124	MORADIYA YASH AKHILBHAI	B.SC SEM 6	Anand Farm and Nursery, Gandhinagar	Nursey Report
47	202002102926	CHAUDHARY ALPESHBHAI VIRABHAI	B.SC SEM 6	phedra kurumanchiana(Ephedraceae), B.	Project Report
48	202002102928	CHAUDHARY APILBHAI GOVABHAI	B.SC SEM 6	phedra kurumanchiana(Ephedraceae), B.	Project Report
49	202002103389	SUTHAR NAVINKUMAR DINESHIJI	B.SC SEM 6	phedra kurumanchiana(Ephedraceae), B.	Project Report
50	202002102961	CHAUHAN TUSHARSINH DHARMENDRASINH	B.SC SEM 6	phedra kurumanchiana(Ephedraceae), B.	Project Report
51	202002103417	VADSARA RIYA MUKESHBHAI	B.SC SEM 6	inobotany of Butea monosperma, Vijaynag	Project Report
52	202002103136	PADSUMBIYA KINJAL HEMANTBHAI	B.SC SEM 6	inobotany of Butea monosperma, Vijaynag	Project Report
53	202002103124	MORADIYA YASH AKHILBHAI	B.SC SEM 6	inobotany of Butea monosperma, Vijaynag	Project Report
54	202002103303	PRAJAPATI KHUSHI VIJAYKUMAR	B.SC SEM 6	inobotany of Butea monosperma, Vijaynag	Project Report
55	202002104798	PUNADIYA DHAVALKUMAR SHANTILAL	B.SC SEM 6	inobotany of Butea monosperma, Vijaynag	Project Report
56	202002102696	AHIR LAKHMAN DEVRAJ	B.SC SEM 6	Hydroponics	Project Report
57	202002103309	PRAJAPATI PANKTIBEN BHANUBHAI	B.SC SEM 6	Hydroponics	Project Report
58	202002103325	RAIYANI PRIYANK CHANDUBHAI	B.SC SEM 6	Hydroponics	Project Report
59	202002103385	SONI UDAY MUKESHKUMAR	B.SC SEM 6	Hydroponics	Project Report
60	202002103032	HUMBAL VAIDIK SUBHASHBHAI	B.SC SEM 6	Hydroponics	Project Report
61	202002103433	VAGHELA VISHALSINH LALSINH	B.SC SEM 6	Hydroponics	Project Report



  
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## GOVERNMENT SCIENCE COLLEGE, GANDHINAGAR

M.Sc. (CHEMISTRY) SEMESTER -4 (2022-2023)

## DISSERTATION AND THREE - WEEK INDUSTRIAL TRAINING SUCCESSFULLY COMPLETED STUDENTS LIST

ROLL NO.	Name	Enrollment No	Name of Project
GIA-01	ASARI MITESH HARESHBHAI	202102300410	Estimation of Vitamin C in Amla
GIA-02	BARAD BHAGIRATH BHUPATBHAI	202102300411	Synthesis of gold nanoparticles and its comparative study
GIA-03	BHAVSAR SHAISHAV DIPAKKUMAR	202102300413	Mesoporous compounds
GIA-04	CHAUDHARY VISHVAKUMAR SURESHKUMAR	202102300415	Future of Battery technology
GIA-05	CHAVDA AMANSINH SETANSINH	202102300416	Future of Battery technology
GIA-06	CHAVDA MITABEN BIPINBHAI	202102300418	Analysis of water quality of samples collected
GIA-07	CHUDASAMA CHANDRADEEPSINH BHUPENDRASINH	202102300419	Future of Battery technology
GIA-08	DANTANI PAYALBEN NARAYANBHAI	202102300420	Capsaicin Extraction from Chilli
GIA-09	DARAJI BHAVESH KUMAR PRAKASHBHAI	202102300421	Reactive Azo dyes at Colorant Chemical Pvt Ltd
GIA-10	DESAI JANAKBEN TEJABHAI	202102300424	Analysis of water quality of samples collected
GIA-11	DESAI KRUPABEN RAMESHBHAI	202102300423	Analysis of water quality of samples collected
GIA-13	GAJJAR NIRAVKUMAR KETANKUMAR	202102300423	Define a presence of metals in ore
GIA-15	KANSAGARA RAJANKUMAR PRADIPKUMAR	202102300433	Define a presence of metals in ore
GIA-16	MUNIYA PRAGNABEN SAMUDABHAI	202102300435	Capsaicin Extraction from Chilli
GIA-17	PANCHAL HEMAKSHIBEN JITENDRAKUMAR	202102300436	Extraction of quercetin from onions
GIA-18	PANDOR KARISHMABEN VISHRAMBHAI	202102300437	Define presence of metal in ore
GIA-20	PATEL AKSHI MAHENDRABHAI	202102300443	Sulphonation of Tobias Acid
GIA-21	PATEL ARJUN BALDEVBHAI	202102300444	Extraction of nicotine from tobacco leaves
GIA-22	PATEL AXIBEN PARESHBHAI	202102300445	Sulphonation of Tobias Acid
GIA-23	PATEL BHAUMIK PANKAJBHAI	202102300446	Extraction of nicotine from tobacco leaves
GIA-24	PATEL DHARMIK MUKESHBHAI	202102300448	Define presence of metal in ore
GIA-25	PATEL FIZA RAMESHKUMAR	202102300449	Extraction of nicotine from tobacco leaves
GIA-26	PATEL FORAMBEN BHAVESHBHAI	202102300450	Extraction of quercetin from onion
GIA-27	PATEL HARSH GIRISHKUMAR	202102300451	Assay in Cevoctrizine Tablet by HPLC
GIA-28	PATEL HETASVI VASUDEV	202102300452	Assay in Cevoctrizine Tablet by HPLC
GIA-31	PATEL MAHIMA PRAVINBHAI	202102300456	Assay in Cevoctrizine Tablet by HPLC
GIA-32	PATEL VAIBHAVKUMAR VIKRAMBHAI	202102300440	Starch : Studies and Extraction
GIA-33	PRAJAPATI DHAVALKUMAR RAMESHBHAI	202102300463	Different parameters in some groundnut oil
GIA-35	SHELAT KRUTIVASA GIRISHKUMAR	202102300467	Different parameters in some groundnut oil
GIA-36	SOLANKI FLAIR ASHOKKUMAR	202102300468	Synthesis an optimization of gold nanoparticles by wet chemicals

GIA-37	SOLANKI NIKHIL KUMAR BABULAL	202102300470	Dissertation project
GIA-39	THAKOR PRATIKSINH RANJITSINH	202102300474	Analysis of water quality of sample water collected from Narmada river
GIA-40	VASAVA ANAND GAMBHIRBHAI	202102300477	Analysis of water quality of sample water collected from Narmada river
GIA-41	VASAVA ASHISHBHAI ISWARBHAI	202102300478	Analysis of water quality of water sample collected from Narmada river
GIA-42	VASAVA PRAGNE SHIKUMAR MOVASIBHAI	202102300479	Analysis of water quality of sample water collected from Narmada river
HPP-01	BARASARA DIVYE SH RAJE SHBHAI	202102300412	Synthesis and Analysis of Reactive dye
HPP-02	CHAUDHARI NIKIBEN RAMESHBHAI	202102300414	Physico - Chemical Analysis of GIDC Naroda canal water and Sabarmati River at Sant Sarovar
HPP-03	CHAVDA DHAVALSINH HITENDRASINH	202102300417	Characterization of Acid Black - 210
HPP-04	DEDANIYA PRITKUMAR PRADIPBHAI	202102300422	Physico - Chemical Analysis of GIDC Naroda canal water and Sabarmati River at Sant Sarovar
HPP-05	DHALAN SHIVANI SURENDER	202102300426	Extraction of Nicotine
HPP-06	DHIRENKUMAR AHIRRAO NARESHBHAI	202102300427	Physico - Chemical Analysis of GIDC Naroda canal water and Sabarmati River at Sant Sarovar
HPP-07	GADHIYA AKSHAYKUMAR KANTIBHAI	202102300428	Physico - Chemical Analysis of GIDC Naroda canal water and Sabarmati River at Sant Sarovar
HPP-08	GAMBHAVA KISHAN HARESHBHAI	202102300430	Physico - Chemical Analysis of GIDC Naroda canal water and Sabarmati River at Sant Sarovar
HPP-09	KANETIYA ABHISHEK KISHORBHAI	202102300432	Synthesis and Analysis of Reactive Black dye
HPP-10	KHATANA DHAVALKUMAR PRABHATBHAI	202102300434	Method development on HPLC
HPP-12	PATEL ADIT PRADIPKUMAR	202102300441	Synthesis and Characterization of Acid Black - 210
HPP-13	PATEL DEEP PRAMODBHAI	202102300447	Physico - Chemical Analysis of GIDC Naroda canal water and Sabarmati River at Sant Sarovar
HPP-14	PATEL KHYATI AMRUTLAL	202102300453	Determination of iron in fluors by thiocyanate colorimetry method
HPP-16	PATEL NEHABEN ANILKUMAR	202102300458	Extraction of Tartaric acid from Tamarind pulp and leaves
HPP-17	PATEL NIDHI HARESHKUMAR	202102300459	Determination of iron content in some leafy vegetables and herbs by Colorimetric method
HPP-18	PATEL NIRMAL KANAIYALAL	202102300460	Extraction of Tartaric acid from Tamarind fruit pulp and tamarind leaves
HPP-20	PITHIYA SONIKABEN RAMBHAI	202102300462	Determination of iron in vegetables and herbs by thiocyanate colorimetry method
HPP-21	PRAJAPATI MEGHABEN RAJENDRAKUMAR	202102300464	Determination of iron in vegetables and herbs by thiocyanate colorimetry method
HPP-23	SOLANKI GAUTAMKUMAR JIVANLAL	202102300469	Synthesis and Optimization of gold nanoparticles by wet chemical method
HPP-24	SOLANKI PRATIPALSINH MAKANSINH	202102300471	UV - Spectrophotometric method for quantification of Ascorbic acid in fresh fruit juices
HPP-25	TAK KULSHRESTH ANILKUMAR	202102300472	Ascorbic Acid determination in fresh fruits juice
HPP-26	VAGH RAHULKUMAR DINESHBHAI	202102300475	Ascorbic Acid determination in fresh fruits juice
HPP-27	VAGHELA KEYURSINH MAHESHBHAI	202102300476	Dissolution of moxifloxacin Hydrochloride by HPLC

Total : (58)



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GOVERNMENT SCIENCE COLLEGE, GANDHINAGAR  
 ZOOLOGY DEPARTMENT

2022-23

Sr. no.	Enrollment No.	Full Name	programme name	Title	Field Work equivalent to tour/Report Nursery Report
1	202002102856	AYAR HIRABHAI HAMIRBHAI	B.sc. Sem 5	Thol Bird Sanctuary	Tour Report
2	202002102887	BOLIYA HITESHKUMAR RAMJIBHAI	B.sc. Sem 5	Thol Bird Sanctuary	Tour Report
3	202002102917	CHAUDHARI SANJANAKUMARI CHETANBHAI	B.sc. Sem 5	Thol Bird Sanctuary	Tour Report
4	202002102964	CHAVDA ARPIT BHUPAT BHAI	B.sc. Sem 5	Thol Bird Sanctuary	Tour Report
5	202002102968	CHAVDA MAN MUKESHKUMAR	B.sc. Sem 5	Thol Bird Sanctuary	Tour Report
6	202002102969	CHAVDA PARAS GOGANBHAI	B.sc. Sem 5	Thol Bird Sanctuary	Tour Report
7	202002102970	CHAVDA PARBAT RAJSHI	B.sc. Sem 5	Thol Bird Sanctuary	Tour Report
8	202002102972	CHAVDA UDAYSINH KAMLESHSINH	B.sc. Sem 5	Thol Bird Sanctuary	Tour Report
9	202002102979	CHUDASAMA KISHAN HARDAS BHAI	B.sc. Sem 5	Thol Bird Sanctuary	Tour Report
10	202002102982	DABHI RAHULSINH VIJAYSINH	B.sc. Sem 5	Thol Bird Sanctuary	Tour Report
11	202002103003	DESAI RUSHI KANUBHAI	B.sc. Sem 5	Thol Bird Sanctuary	Tour Report
12	202002103024	GOHIL SATISHKUMAR KARSHANBHAI	B.sc. Sem 5	Thol Bird Sanctuary	Tour Report
13	202002102743	GOSWAMI PRUTHVIRAJGIRI GAJENDRAGIRI	B.sc. Sem 5	Thol Bird Sanctuary	Tour Report
14	202002101252	HONGAL VAIBHAVI SANDEEP	B.sc. Sem 5	Thol Bird Sanctuary	Tour Report
15	202002101846	JATIYA KRUNAL BABULAL	B.sc. Sem 5	Thol Bird Sanctuary	Tour Report
16	202002103050	JOSHI DIXIT RAMESHBHAI	B.sc. Sem 5	Thol Bird Sanctuary	Tour Report
17	202002103074	KHARADI KHUSHBU CHUNILAL	B.sc. Sem 5	Thol Bird Sanctuary	Tour Report
18	202002103144	PANCHANI BATUKBHAI BABUBHAI	B.sc. Sem 5	Thol Bird Sanctuary	Tour Report
19	202002103331	RATHAVA YOGESHKUMAR MOHANBHAI	B.sc. Sem 5	Thol Bird Sanctuary	Tour Report
20	202002103347	ROY JAYKUMAR RAVIKANT	B.sc. Sem 5	Thol Bird Sanctuary	Tour Report
21	202002103379	SOLANKI RAHUL DASHARATHJI	B.sc. Sem 5	Thol Bird Sanctuary	Tour Report
22	202002103387	SUTARIYA VIVEKKUMAR BABUBHAI	B.sc. Sem 5	Thol Bird Sanctuary	Tour Report
23	202002103426	VAGHELA HARVIKUMARI JAYDEVSIKH	B.sc. Sem 5	Thol Bird Sanctuary	Tour Report
24	202002103427	VAGHELA HEMANGIBA GIRISHSINH	B.sc. Sem 5	Thol Bird Sanctuary	Tour Report
25	202002103445	VARVARIYA BOGHABHAI LAKHMANBHAI	B.sc. Sem 5	Thol Bird Sanctuary	Tour Report
26	202002103448	VASAVA ANKITABEN ASHVINBHAI	B.sc. Sem 5	Thol Bird Sanctuary	Tour Report
27	202002103456	VASAVA SHEETALBEN CHHANIYABHAI	B.sc. Sem 5	Thol Bird Sanctuary	Tour Report

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# Environment and Sustainability

GUJARAT UNIVERSITY B.Sc. BOTANY ( Faculty of Science , CBCS Theory syllabus Effective from June-2022

## SEMESTER-I

### Unit-3 : Environmental Biology & Climate Change

[ 10 hours ]

**Objectives:** To acquaint students with Basic concept and current trends of Ecology, Environment and climate change .

- Introduction, Scope and Branches of Ecology.
- Ecosystems; Its Kinds: Natural, Artificial.
- Ecosystems; Structure and Functions of Ecosystems.  
Components of Freshwater Ecosystem (Pond).  
Components of Terrestrial Ecosystem (Grassland).  
Biogeochemical Cycles - Nitrogen, Phosphorus.
- Biotic Factors : Symbiotic Interactions  
Positive Interactions: Mutualism, Commensalism, Protocooperation.  
Negative Interactions: Exploitation (Parasitism, Predation) Antibiosis, Competition
- Climate change & Sustainable Biodiversity: Importance of Biodiversity Sources.  
IUCN Categories of threat and list of endangered plant species of Gujarat.  
Concept of Carbon foot print & Carbon trading.  
Effect & Control of Air, Water and Soil Pollution.

#### Suggested Readings

- (i) *Textbook of Ecology by G.Tailer Miller, Jr.Scott E. Spoolman. Cengage Learning*
- (ii) *Plants and Environment by Daubenmire (Wiley-Eastern Pvt. Ltd., New Delhi)*
- (iii) *Ecology and Environment by P.D.Sharma Rastogee Publication*
- (iv) *Basic Ecology – Eugene P. Odum*
- (v) *Fundamentals of Ecology- P. Odum*
- (vi) *Concept in Indian Ecology and Environmental Science – S. V. S. Rana*
- (vii) *Ecology Theories and Application – Peter Stiling*
- (viii) *Ecology & Environment – P. D. Sharma, Rastogi Publications*
- (ix) *Indian Manual of Plant Ecology – R .Misra & G. S. Puri*



  
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## **Biodiversity**

### **Unit - I**

Biodiversity –Definition, different levels, importance, threats, Global and local efforts for conservation.

### **Unit - II**

Microbial Diversity - Different forms, Utility – industrial, pharmaceutical, agricultural, methods for isolation and identification

### **Unit - III**

Plant Diversity – Sampling for quantification, different forms, agrodiversity, forests and medicinal plants

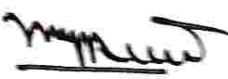
### **Unit - IV**

Faunal Diversity – Origin of life, characteristics, different forms, invertebrates, vertebrates, evolutionary trend

### **Suggested readings**

1. Biodiversity, TERI, New Delhi
2. Textbook of Microbiology, S Chand and Co., New Delhi
3. An Advanced Textbook on Biodiversity, Oxford & IBH, New Delhi
4. Ecology, Cengage Learning, New Delhi



  
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EC

**Course of Environmental science**  
**Sem II 2015**

**Unit 1 Natural resources**

- Renewable resources
- Non renewable resources
- Types of natural resources
  - Forest
  - Water
  - Energy
- Role of individual in conservation of natural resources

**Unit 2 Ecosystem**


- Introduction: concept & general definition
- Classification of ecosystem
- Components of ecosystem: Producers, consumers, decomposers
- Forest ecosystem
- Grassland ecosystem

**Unit 3 Biodiversity & conservation**

- Introduction, Definition and general concept
- Different types of biodiversity studies
- Uses of biodiversity
- IUCN categories of threats
- Conservation of biodiversity

**Unit 4 Environmental Pollution**

- Introduction, Definition and different type of pollution
- Causes effect and control of
  - Air Pollution
  - Water pollution
  - Noise Pollution
  - Nuclear Pollution

  
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GUJARAT UNIVERSITY  
B. Sc. Semester-III  
BOTANY

Choice Based Credit System Syllabus : Effective from June - 2018



GUJARAT UNIVERSITY  
B. Sc. Semester-III  
BOTANY

Choice Based Credit System Syllabus : Effective from June - 2018

**Core Course (CC) Paper BOT- 202 (Theory)**  
[ PLANT ANATOMY, ECOLOGY, EMBRYOLOGY & CELL BIOLOGY ]

Credits: 04

Teaching Hours: 04 hours / Week

Total Marks: 100 (External 70 + Internal 30 ) Marks

**UNIT - I: PLANT ANATOMY.**

- Meristems: Characteristics, classification and theories of root - shoot apical meristem.
- The cambium: Types and functions.
- Simple Plant tissues: Types, Structure and functions.
- Comparative account of anatomy in following :  
Dicot stem (**Sunflower**) and Monocot stem (**Maize**)  
Dicot root (**Sunflower**) and Monocot root (**Maize**).
- Normal Secondary growth in **Sunflower** stem .

**UNIT - II: PLANT ECOLOGY :**

- Edaphic factors: Composition of soil, origin and development of soil, soil water, soil profile, soil erosion and soil conservation.
- Autecology of species-Biological clock , Definition and brief understanding of Ecads and Ecotypes, Ecological niche.
- Remote sensing- Definition and applications for ecosystem management.
- Ecological adaptations in Hydrophytes and Xerophytes : General account.  
External and Anatomical adaption of Following :  
Hydrophytes : **Hydrilla** stem and **Nymphaea** petiole  
Xerophytes : **Nerium** leaf and **Casuarina** stem

**UNIT - III: PLANT EMBRYOLOGY.**

- Structure of microsporangium and male gametophyte.
- Structure of ovule and its types.
- Structure of megasporangium and female gametophyte.  
Monosporic, Bisporic, Tetrasporic ( Fritillaria type ).
- Pollination- Definition and types. Pollination in **Salvia** and **Calotropis**.
- Fertilization in plants, Double fertilization.

**UNIT- IV: PLANT CELL BIOLOGY**

- Ultrastructure and Function of the following cell organelles :  
1. Cell wall                      2. Endoplasmic reticulum                      3. Ribosome  
4. Nucleus                      5. Lysosomes                      6. Dictyosomes
- Structure and models of plasma membrane :  
Sandwich model, Unit- membrane model and Fluid-mosaic model



  
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**BOT 304: ( Ecology, Phytogeography, Economic Botany, Biostatistics )**

**304/1 UNIT:1**

(10 lectures)

**PLANT ECOLOGY:**

- Vegetation development: Concept of Succession, Types of succession, Mechanism of ecological succession; Hydrosere, Xerosere.
- Synecology: Methods of studying plant communities.
- Analytical and Synthetic characters of plant community.
- Raunkiaer's life forms, Biological Spectrum.
- Halophytes: Types of Halophytes, ecological adaptations in Halophytes.

**304/2 UNIT:2**

(10 lectures)

**PHYTOGEOGRAPHY:**

- Phytogeography: Definition, aims, objectives, scope and relation with other disciplines
- Endemism: Definition, Types, Causes, Theories.
- Botanical regions of India. ( with vegetation importance)
- Vegetation of Gujarat.
- Remote sensing and GIS for plant analysis.

**304/3 UNIT:3**

(10 lectures)

**ECONOMIC BOTANY:**

- General account, Botanical name, family, cultivation methods, climate and uses:
  - CEREALS: Oats, Maize
  - PULSES: Tuver,
  - PLANTATION CROPS: Sugarcane
  - OIL CROPS: Sesamum
- Botanical name, family, useful part, chemical constituents and uses:
  - Condiments and Spices : Clove, Cinnamon, Saffron, Black Pepper
  - Aromatic plants: Fennel: Coriander, Cumin
  - Medicinal Plants: Cinchona, Belladonna, Holy basil-Tulsi

**304/4 UNIT:4**

(10 lectures)

**BIOSTATISTICS:**

- Biometrics: Aims and objectives as applicable to biological science.
- Methods of data collection and graphical representation.
- Measures of central tendency- Mean, mode and Median
- Measures of Dispersion: Range, mean deviation,
- Standard deviation.
- Chi-square and goodness of fit.
- Normal, binomial and Poisson distribution

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**BOT 310 ( Environmental Biology , Gardening, Ethnobotany, Forestry)**

**310/1: UNIT: 1**

(10 lectures)

**ENVIRONMENTAL BIOLOGY :**

- Brief account: Environmental Impact Assessment (EIA), IBP, Man and Biosphere Program (MAB)
- Greenhouse Gases -CO<sub>2</sub>, CH<sub>4</sub>, N<sub>2</sub>, CFCs: Sources, effects and remedies
- Brief account of Climate change and its Consequences -acid rain, Global warming, Sea level Rise, Greenhouse effect Ozone depletion;
- Effects of Air, Water and Soil pollution on vegetation .

**310/2 UNIT: 2**

(10 lectures)

**GARDENING:**

- Principles of Garden Design
- Garden features: Paths or walkways, avenues, arches, lawn, floral beds, hedges, ground cover
- Garden operations: Plant care-Manuring, repotting, Pruning- principles & kinds.
- Landscape designs in India- Buddhist, Mughals, etc.
- Vertical gardening- concept, principle and plant materials.

**310/3 UNIT:3**

(10 lectures)

**ETHNOBOTANY:**

- History and development of Ethnobotany
- General account of Sacred groves
- Methods of Ethnobotanical research
- Plants in religious belief
- Plants used by tribes of Gujarat:
  - *Achyranthes aspera* , *Asparagus racemosus*,
  - *Butea monosperma* , *Calotropis procera*,
  - *Ficus religiosa* , *Vitex negundo*.

**310/4 UNIT: 4**

(10 lectures)

**FORESTRY:**

- Benefits of Forest : Commercial , Ecological and Aesthetical
- General account of benefits of Forests products- major products- lumber, timber, firewood minor products- medicines, oils
- Forest types of India
- Wood- Physical properties, structural features and identification of wood
- Timber Extraction and Paper industry
- Paper industry
- Wild life and biosphere reserves

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GUJARAT UNIVERSITY : B. Sc. - BOTANY Semester -VI ( Practical paper ) : Effective from June-2019

**BOTANY PRACTICALS:**  
**BOT - 312 Practical II :Session-II**

( Environment biology , Gardening, Ethnobotany, Forestry)

**A). ENVIRONMENTAL BIOLOGY:**

**Mohr's titration method for determination of water hardness:**

1. Determination of Chloride content in water sample
2. Determination of Carbonate and Bicarbonate in water sample
3. Determination of Calcium content in water sample
4. Determination of Total hardness of water sample

**Determination of Carbonate/Nitrate deficiency from the given soil sample. (Quantitative)**

**B). GARDENING**

1. Visit to a garden to study the principles and materials used in landscape design, various garden design .
2. Chart of garden tools and features.

Report to be submitted during practical exam.

**C). ETHNOBOTANY**

Study of Ethnobotanical importance following specimens .

1. *Achyranthes aspera* ,
2. *Asparagus racemosus*
3. *Butea monosperma.*,
4. *Calotropis procera*
5. *Ficus religiosa.*,
6. *Vitex negundo*

**D). FORESTRY**

Identification and characteristics of following wood samples:

1. *Eucalyptus sp.*
2. *Acacia arabica*
3. *Mangifera indica*
4. *Tectona grandis*

**Submissions:** Garden visit Report

**Herbarium of Ethnobotanical samples of plants.**



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SEMESTER - V  
COURSE MI-305.1

**Environmental Microbiology**

**Unit I Microbial ecosystem and environment**

1. Microbial ecosystem (4 hr)  
A. Introduction to populations, communities, ecosystems, microenvironment, ecological niche, microbial ecology and environmental microbiology  
B. Microbial consortia, biofilms and microbial mats  
C. Microorganisms and ecosystem  
D. Microorganism movement between ecosystems
2. Microbial habitat and environment (4 hr)  
A. Water as microbial habitat  
B. Soil as an environment for microorganisms  
C. Extreme environments

**Unit II Microbial environmental processes**

1. Microbiology of green house gases (4 hr)  
A. Soil microorganisms and atmosphere: Role of soil microorganisms in production and utilization of green house gases  
B. Methane based mutualism  
C. The rumen ecosystem
2. Role of microbes in soil fertility (3 hr)  
A. Symbiotic and non symbiotic nitrogen fixation by microorganisms  
B. Soil, Plant and Nutrients: Biodegradation of cellulose & lignin to increase soil organic matter
3. Geochemical process: Acid mine drainage (1 hr)

**Unit III Pollution microbiology**

1. Biological indicators of pollution (1 hr)  
Water pollution-coliforms & harmful algal blooms, Air pollution-lichens
2. Waste treatment and disposal (5 hr)  
A. Biological treatment of liquid waste: trickling filter, activated sludge process, biodisc system  
B. Biological treatment and disposal of solid waste: anaerobic sludge digestion, composting and sanitary landfills
3. Biodegradation of environmental pollutants (2 hr)  
A. Alkylbenzyl sulfonates

Page 11 of 14



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- B. Chlorinated compounds
- C. Biomagnifications of DDT & Mercury

#### Unit IV Environmental biotechnology

##### 1. Microbial processes

- A. Microbially enhanced oil recovery
- B. Bioremediation of petroleum hydrocarbons
- C. Bioleaching of copper

(4 hr)

##### 2. Microbial products

- A. Biofuels: ethanol, hydrogen, methane and other hydrocarbons
- B. Biodegradable polymers (biodegradable plastics)
- C. Microbial pesticides

(4 hr)

#### Reference Books

1. **Principles of Microbiology**, R. M. Atlas, 2<sup>nd</sup> Edition (Indian Edition) (2015), McGraw Hill Education (India) Private Limited –New Delhi
2. **Microbiology**, Prescott, Harley, and Klein's J. M. Willey, L. M. Sherwood, C. J. Woolverton, 7<sup>th</sup> Edition (2008), McGraw Hill Higher Education- USA
3. **Microbiology**, Pelczar Jr M. J., Chan E. C. S., Krieg N. R. 5<sup>th</sup> edition (1986), McGraw Hill Book Company NY



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Gujarat University  
Syllabus for B. Sc. Semester V  
CHE – 305 (Subject Elective)  
Soil Composition and Analysis

Unit I

Introduction to Soil Chemistry [14 Marks]

Importance of soil, soil formation, composition of soil, the soil profile, types of soil, micro and macro plant nutrients.

Unit II

Analysis of Primary Nutrients [14 Marks]

Soil fertility and productivity, techniques for the analysis of soil, soil reaction, determination of total nitrogen in soil, determination of phosphorus in soil, determination of potassium in soil by flame photometry.

Unit III

Analysis of Secondary Nutrients [14 Marks]

Determination of total sulphur in soil, determination of calcium in soil, determination of magnesium in soil, determination of lime and liming material in soil. Mechanical analysis of soil.

Unit IV

Analysis of Micro Nutrients [14 Marks]

Determination of total manganese in soil, determination of Fe (II) and Fe (III) in soil, determination of silica in soil, determination of soluble salts in soil, determination of sodium in soil by flame photometry.

Reference Books

- (1) Environmental Chemistry: H. Kaur, Pragati Prakashan, 2<sup>nd</sup> Edition.
- (2) Soils in our Environment: Raymond W. Miller, Duane T. Gardiner, Prentice Hall, 8<sup>th</sup> Edition.



Govt. Uni. Chemistry Syllabus – B.Sc. Sem-V

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Page 10

**Semester V**  
**CHE - 306**  
**Practical [II] (Organic and Analytical Practicals)**

**[A] Organic Preparation:**

- (i) Nitration of Acetanilide
- (ii) Acetanilide from Aniline (Green Preparation)
- (iii) Benzoic Acid from Benzil (Green Preparation)
- (iv) 1,5-Diphenyl-penta-1,4-diene-3-one from Benzaldehyde and Acetone (Green Preparation)
- (v) Diels-Alder reaction between furan and maleic acid (Green Preparation)

**[B] Analytical:**

**(B-1) Organic Estimation:**

- (i) Unknown Acid (e.g., Oxalic, Succinic, Citric, Tartaric, Benzoic, Phthalic and Cinnamic acid)
- (ii) Ketone (Acetone)
- (iii) Ester

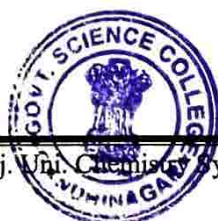
**(B-2) Chromatography [TLC]**

Analysis of the following drugs by Thin Layer Chromatography.

- (i) Aspirin      (ii) Paracetamol      (iii) Ibuprofen

**Reference Books**

- (1) A. I. Vogel, "Elementary Practical Organic Chemistry Part-II, Qualitative Organic Analysis": CBS Publishers & Distributers, New Delhi, 2<sup>nd</sup> Edition, 2004.
- (2) A. I. Vogel, "Elementary Practical Organic Chemistry Part III Quantitative Organic Analysis": CBS Publishers & Distributers, New Delhi, 2<sup>nd</sup> Edition, 2004.
- (3) Hand book of Organic qualitative analysis by H. T. Clarke.
- (4) Practical Organic Chemistry: F. G. Mann and B. C. Saunders. Low – priced Text Book. ELBS, Longman.
- (5) V.K. Ahluwalia, Sunita Dhingra, "Comprehensive Practical Organic Chemistry – Qualitative Analysis": University Press (India) Private Limited, Hyderabad, 1<sup>st</sup> Indian Edition, 2010.
- (6) "Advanced Practical Organic Chemistry": Stanley Thornes Publishers Ltd., J Leonard, B Lygo, G Procter, 1<sup>st</sup> Indian Edition, 2004.
- (7) "Quantitative Analysis": R. A. Day, A. L. Underwood, Prentice-Hall of India Pvt. Ltd., New Delhi, 6<sup>th</sup> Edition, 2004.



Guj. Uni. Chemistry Syllabus – B.Sc. Sem-V

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**PAPER - 301 (Theory)**

(ECOLOGY, ANIMAL DIVERSITY (Nonchordates))

**Unit-I ECOLOGY:**

**A. Biotic Community:**

- Concept of community
- Community stratification in terrestrial habitat
- Community periodicity

**B. Ecological Succession:**

- Kinds of Succession
- Process of succession
- Patterns of succession (Hydrosere, Xerosere)
- Significance of Ecological Succession.

**Reference Books for Ecology:**

1. Fundamentals of Ecology, P. S. Odum, Saunders.
2. Concepts of Ecology, N. Arumugam, Saras Publication, Nagercoil
3. Ecology and Environment, P. D. Sharma, Rastogi Publications, Meerut
4. Ecology, Ricklefs. W. H. Freeman.
5. Concepts of Ecology, 4th Edition, E. J. Kormondy, Prentice Hall of India

**Unit II ANIMAL DIVERSITY (Nonchordate)**

**Type Study & General Topics:**

**A. General structure & morphology with functional anatomy of the following animal:**

**Arthropoda:** Type - **Scorpion (*Palamnaeus*)** Classification Habit & Habitat, Ext. characters, Digestive system, Book lungs, Circulation system, Excretory organs, Nervous system, Sense organs and Reproductive systems



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## SUBJECT ELECTIVE COURSE (SEC)

### PAPER - 305 (Theory)

(POLLUTION, CYTOLOGICAL/ HISTOTECHNOLOGY TECHNIQUES)

#### Unit-I POLLUTION :

Various pollutants & their effects on living organisms

##### ■ Air Pollutants :

- a) Gaseous - CO, SO<sub>2</sub>, NO<sub>2</sub>
- b) Particulate - Dust, Lead, Aerosol.

Effects of air pollution on living organisms

Effects of ozone depletion on human health

##### ■ Water Pollutants :

Biological organisms (bacteria & protozoan), acids, alkalis, dyes, hydrogen sulphide, pesticides, fertilizers, toxic metals (Fluoride, Mercury, Arsenic), faeces, domestic wastes, and suspended matters.

Effects of water pollution on living organisms

- Noise pollution and its effects on physical health

#### Unit-II POLLUTION :

##### ■ Soil/Land Pollutants :

- a) Industrial solid wastes - Toxic metals like Cu, Pb, Ni.
- b) Urban wastes - Garbage, paper, glasses, metal cans, plastics, faeces.
- c) Agricultural sources - Wastes from cattle sheds & poultry farms, fertilizers, pesticides and fumigants.

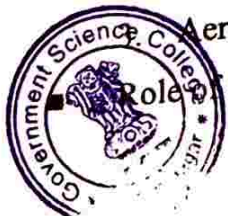
- Radioactive Pollutants and their effects.

##### ■ Biological Treatment of Effluents:

1. Trickling filters system
2. Stabilization Ponds.

Aerated lagoons.

Role of an individual in the prevention of pollution.



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NCC

Environment and Sustainability

GUJARAT UNIVERSITY  
B.Sc. Elective /B.Com Soft Skill/ B.A Soft Skill  
Semester - IV  
(Effective from Jul 2021)

National Cadet Corps: (2 + 1 Credit)  
NCC

Unit-I:

INTRODUCTION TO FIELD CRAFT AND BATTLE CRAFT:

Introduction, Field Craft and Battle Craft, Judging Distance, Practical Hints, Indication of Landmarks and Targets, Introduction, Definitions, Types of Ground, Indication of Landmarks, Methods of Indication Targets, Observation, Camouflage and Concealment: Introduction, Camouflage, Concealment

Unit-II:

ADVENTURE ACTIVITIES, KNOTS, LASHINGS AND STRETCHERS:

Parasailing, Slithering, Rock Climbing, cycling and Trekking, Knots: Knots for Rope ends or for Grips on Thin Rope, Knots for Joining Ropes, Knots to make loops in Rope, Knots for fastening ropes, Lashings: Square Lashings and Frapping Turns, Stretchers: Basic, Wheeled and other types of stretchers

Unit-III:

PE - SOCIAL SERVICE: (Professional Ethics)

Basics of Social Service, Rural Development Objectives, Important Rural Development Programmes, Non-Government Organisations (NGOs), Contribution of NGOs, Contribution of Youth, Role of NCC.

Unit-IV:

E WATER AND ENERGY CONSERVATION: (Environment and Sustainability)

Water Conservation: Introduction, Ways to Conserve Water Indoors, Other practices for water conservation, Rain water Harvesting, Types of Rainwater Harvesting Systems.

Energy Conservation: Introduction, Energy Conservation Measures.

**Text Book:** NCC Cadet's Hand Book (Specialised Subjects) SD/SW (Year: 2019) Unit: 1, 2


NCC Cadet's Hand Book (Common Subjects) SD/SW (Year: 2019) Unit: 2, 3, 4

**Ref. Book:** NCC Cadet Handbook



A.N.O.  
Government Science College,  
Sector-15, Gandhinagar.





Principal  
Government Science College  
Sector-15, Gandhinagar



# GOVERNMENT SCIENCE COLLEGE

Sector – 15, Gandhinagar-382016

Principal

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NAAC Accredited-B+  
(CGPA-2.69)

## NAAC Criteria-1.3.1

### Environment and Sustainability

#### Student Project Report/Field Work

Sr. No.	Academic Year	UG/PG	No. Project Report/Field Work
1.	2018-19	UG	05
		PG	NIL
2.	2019-20	UG	05
		PG	05
3.	2020-21	UG	06
		PG	NIL
4.	2021-22	UG	06
		PG	02
5.	2022-23	UG	07
		PG	28



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