MATHEMATICS

I/c. Registrar
Hemchandracharya
North Gujarat University
PATAN

EMCHANDRAC AR A N RT JARAT UNIVERSITY
PATAN- 384 265

Modified Detailed Syllabus of CBCS PROGRAMME Pattern for B Sc Mathematics Semester System

PROGRAM CODE : HNGU1054

With Effect from June : 2015

FACULTY : SCIENCE

SUBJECT : MATHEMATICS

CLASS: Bachelor of Science.

SEMESTER : I to VI

TOTAL PAGE 01 T 27 (WITH C RSE STRUCTURE)

DATE : October 18, 2014.

I/c. Registrar
Hemchandracharya
North Gujarat University
PATAN

B Sc in Mathematics : PROGRAMME Structure Under CBCS

With Effect from June : 2015

M. B. Prajapati, ***Department of Mathematics,***
Hemchandracharya North Gujarat University, Patan-384265.

Mission: Our mission is to provide opportunities for developing basic-quality mathematical skills and achievement for their betterment of life through scientific and technological development.

Learning outcomes: Four major focusing areas: Logical Reasoning & Motivation; Analysis & Problem solving; Information & Technology Proficiency.

Vision: To Motivate Individuals to excel in the mathematical basic knowledge-driven environment of the 21st century through curriculum and train integrally human resources through teaching.We **Focus** on quality education.

(1) EDUCATIONAL AIMS :

Mathematics is one of the fundamental disciplines in science. It is the basic for all the disciplines. To make education more effective and learner centric, restructurisation of curriculum becomes essential. As a positive step in this direction and in order to respond to the emerging trends in the global scenario, it is decided to introduce the Choice Based Credit System (CBCS) from the academic year 2011-12 and modified it after three years. Under this system, the academic programme becomes student-oriented, relevant, interdisciplinary and flexible.

(2) CONDITIONS FOR ADMISSION :

A candidate who has passed the H Sec-Science Degree examination of the state or any other examinations accepted by the Syndicate as equivalent thereto shall be eligible for admission to this B Sc Programme in Mathematics on full-time basis of study.

INTAKE rules for admission are as per University notification from time to time.

Students are allowed to take admissions to successive semesters under carry over benefit facility as per the norm decided by the university .

(3) ***LEARNING OUTCOMES :***The programme leading to this degree provides the opportunities to develop and demonstrate knowledge and understanding in the following areas:

- **Knowledge and understanding :**When one has completed this degree he/she will have knowledge and understanding of the fundamental concepts, principles and techniques from a range of topic areas.
- **Cognitive skills :**When one has completed this degree he/she will be able to understand how to solve some problems using the methods taught and develop abstract mathematical thinking .
- **Practical skills:** When one has completed this degree, he/she will be able to demonstrate the Communicate clearly knowledge, ideas and conclusions about mathematics and improve his/her own learning and performance.

(4) DURATION OF THE COURSE:

The CBCS pattern B. Sc. programme with multidisciplinary approach in Mathematics is offered on a full-time basis. The duration of the course is of three academic years consisting of six semesters each of 15 weeks duration.

(5) TEACHING, LEARNING METHODS :

All relevant material is provided and taught in the course texts and through the study of set books. One will build up knowledge gradually, with sufficient in-text examples to support one's understanding. He/She will be able to assess his/her own progress and understanding by using the in-text problems and exercises at the end of each unit in form of practical using computer in computer laboratory.

(6) ***COURSE OF STUDY :***

The curriculum has five major components:

1. *Principle/Core Courses (CC MAT)*
2. *Practical courses (PC MAT)*
3. *Elective Opt. Disciplinary courses (ES MAT)*
4. *Elective Generic course*
5. *Foundation Course*

There are at least 144 Credit COURSEs prescribed in the above classification as per the university norms to be studied to acquire B.Sc. Degree in Mathematics.

⇛ COURSE STRUCTURE ☒

SEMESTER-I Course	Courses	Credit /course	Teaching Hrs Total	Total Credits	Examination Internal	Hours	External	Total Marks
Principle/Core Courses: CC MAT-111	1	4	4	4	30	3	70	100
Practical/ PC MAT-111	1	2	4	2	-	-	50	50
Elective Opt. Disciplinary: ES MAT –11 Set Theory & Functions	1	2	2	2	-	-	50	50
Elective Generic	1	2	2	2	-	-	50	50
Foundation Course	1	2	2	2	15	1.5	35	50
SEMESTER-II								
Principle/Core Courses: CC MAT-122	1	4	4	4	30	3	70	100
Practical/ PC MAT-122	1	2	4	2	-	-	50	50
Elective Opt. Disciplinary: ESMAT –12 Industrial Mathematics	1	2	2	2	-	-	50	50
Elective generic	1	2	2	2	-	-	50	50
Foundation course	1	2	2	2	15	1.5	35	50
SEMESTER-III								
Principle/Core Courses: CC MAT-301	1	3	3	3	30	3	70	100
Principle/Core Courses: CC MAT-302	1	3	3	3	30	3	70	100
Practical/ PC MAT-301	1	1.5	3	1.5	-	-	50	50
Practical/ PC MAT-302	1	1.5	3	1.5	-	-	50	50
Elective Opt. Disciplinary: ESMAT –21 Business Mathematics-1	1	2	2	2	-	-	50	50
Elective generic	1	2	2	2	-	-	50	50
Foundation course	1	2	2	2	15	1.5	35	50
SEMESTER-IV								
Principle/Core Courses: CC MAT-401	1	3	3	3	30	3	70	100
Principle/Core Courses: CC MAT-402	1	3	3	3	30	3	70	100
Practical/ PC MAT-401	1	1.5	3	1.5	-	-	50	50

Practical/ PC MAT-402	1	1.5	3	1.5	-	-	50	50
Elective Opt. Disciplinary: ESMAT –22 Business Mathematics-II	1	2	2	2	-	-	50	50
Elective generic	1	2	2	2	-	-	50	50
Foundation course	1	2	2	2	15	1.5	35	50
SEMESTER-V								
Principle/Core Courses: CC MAT-501	1	3	3	3	30	3	70	100
Principle/Core Courses: CC MAT-502	1	3	3	3	30	3	70	100
Principle/Core Courses: CC MAT-503	1	3	3	3	30	3	70	100
Principle/Core Courses: CC MAT-504	1	3	3	3	30	3	70	100
Practical/PC MAT-501	1	1.5	3	1.5	-	-	50	50
Practical/PC MAT-502	1	1.5	3	1.5	-	-	50	50
Practical/PC MAT-503	1	1.5	3	1.5	-	-	50	50
Practical/PC MAT-504	1	1.5	3	1.5	-	-	50	50
Elective Opt. Disciplinary: ESMAT –31 Business Mathematics-III	1	2	2	2	-	-	50	50
Elective generic	1	2	2	2	-	-	50	50
Foundation course	1	2	2	2	15	1.5	35	50
SEMESTER-VI								
Principle/Core Courses: CC MAT-601	1	3	3	3	30	3	70	100
Principle/Core Courses: CC MAT-602	1	3	3	3	30	3	70	100
Principle/Core Courses: CC MAT-603	1	3	3	3	30	3	70	100
Principle/Core Courses: CC MAT-604	1	3	3	3	30	3	70	100
Practical/PC MAT-601	1	1.5	3	1.5	-	-	50	50
Practical/PC MAT-602	1	1.5	3	1.5	-	-	50	50
Practical/PC MAT-603	1	1.5	3	1.5	-	-	50	50
Practical/PC MAT-604	1	1.5	3	1.5	-	-	50	50
Elective Opt. Disciplinary: ESMAT –32 Business Mathematics-IV	1	2	2	2	-	-	50	50
Elective generic	1	2	2	2	-	-	50	50
Foundation course	1	2	2	2	15	1.5	35	50

N.B. :1. *Work-load depends on the number of students and the number of Batches/Groups , for practical and Cognitive-skill based Course.*

2. As the *CBCS has a high probability to be operationalised efficiently and effectively for the elevating learners* , the Essential Requirements for all Mathematical Practical including MATLAB Practicals of Mathematical subjects are as under:

1. **Mathematical Laboratory inbuilt with sufficient number of Computers (as per the students enrollments and the number of practical batches) and MATLAB SOFTWARE with basic requirements for the MATLAB Practicals.**
2. **Mathematical Laboratory inbuilt with Graphs, Charts, Printer, Physical Models (two dimensional as well as three dimensional) & Virtual Models (Higher Dimensional – Computerized) and basic requirements for the same.**
3. Use also "PYTHON" Software instead of MATLAB Software.
4. ***Essential Requirement for Mathematical Computer Laboratory:***

(i) Atleast One full time Computer Operator having mathematical ability to run Matlab Software and related Computerized Mathematical Practical.

I/c. Registrar
Hemchandracharya
North Gujarat University
PATAN

(ii) One Peon for computer laboratory.

I/c. Registrar
Hemchandracharya
North Gujarat University
PATAN

DETAILS OF B Sc PROGRAMME

Mathematics : Semester-1

Course : CC MAT-111

UNIT 1: Successive differentiation:

Successive Derivatives, Some standard results for n^{th} derivatives, Leibnitz's Theorem and its examples. Cauchy's Mean Value Theorem.Taylor's Therom (without proof), power series of sinx,cosx,e^x.Maclaurians series and its examples.Expansion of

UNIT 2: Integration:

Reduction formula $\int_0^{\pi/2} \sin^n \theta d\theta$ $\int_0^{\pi/2} \cos^n \theta d\theta$ $\int_0^{\pi/2} \sin^m \theta \cos^n \theta d\theta$, m,n N.

Application of definite integrals to (a) Summation of the series (b) Rectification (c) Surface and volume revolution.

UNIT 3:

(a) Vector analysis : scalar and vector product of three vectors, product of four vectors, reciprocal vectors, vector differentiation, gradient, divergent and curl.

(b) Polar co-ordinates, spherical and cylinder coordinates and their relations.

UNIT 4: Sphere, Cone and Cylinder and introduction to Conicoids:

(a) **Sphere:** plane section of sphere, intersection of two sphere, intersection of sphere and line, power at a point, tangent plane and normal. Plane of contact, angle of intersection of two spheres, condition of orthogonality.

(b) **Cone and cylinder:**
Definition of cone,vertex,guiding curve, generators, equation of a cone with a given vertex and a guiding curve, right circular cone with given vertex, axis and semi vertical angle. Definition of a cylinder, equation of a cylinder whose generators intersect a given cone and are parallel to a given line, equation of a right circular cylinder.

(c) Concoid: Standard equation of ellipsoid, hyperboloid of one and two sheets, Elliptic paraboloid and hyperbolic paraboloid.

Reference Books:

(1) Differential Calculus, by Shantinarayan.
(2) Integral Calculus, by Shantinarayan.
(3) Vector Analysis, by Murry R. Spiegel.
(4) Vector Analysis, by Dr.K.S.Rawat, SARUP &SONS, DELHI
(5) Introduction to Vector Analysis, Fifth Edition, by Herry F. Davis, Arther David Saider

Course : PC MAT-111

UNIT 1 Introduction to Excel using Computer in a computer laboratory.

(i) Simple calculation through Excel ,(iii) Graphical Presentation of Trigonometric functions, Inverse Trigonometric functions and hyperbolic Trigonometric functions, logarithmic functions, polynomial functions through Excel

UNIT 2: Practical based on successive differentiation, Cauchy Mean value theorem, Taylor's & Meclurian's theorem,

UNIT 3 : Practical based on integral and reduction formula, Summation of the series, Rectification , surface & volume.

UNIT 4 : Practical based on Sphere, Cone, Cylinder, Application of gradient, divergent and curl.

List of Practicals :

Unit:1 (1)Draw the graph of sin x, cos x, tan x, cot x, secx, cosecx .

(2) Draw the graph of $\sin^{-1}x$, $\cos^{-1}x$, $\tan^{-1}x$, $\cot^{-1}x$, $\sec^{-1}x$, $\text{cosec}^{-1}x$.

(3) Draw the graph of sinh x, cos hx, tan hx, cot hx.

(4) Draw the graph of $\log_a x$ & a^x, $a \in R^+ - \{1\}$.

(5) Draw the graph of cardioids, asteroid.

I/c. Registrar
Hemchandracharya
North Gujarat University
PATAN

Unit:2 (1)Find the n^{th} derivative of the given function at given point.

(2)Application of Leibnitsz theorem.

(3) Application of Cauchy Mean value theorem.

(4) Application of Taylor's theorem.

(5) Application of Maclurain theorem.

Unit:3(1)Appication of Riduction formula for integration.

(2)Summetion of series using integration.

(3) Appication of rectification by using integration.

(4) Appication of surface revolution using integration.

(5) Appication of volume revolution.

Unit:4(1) Application of gradient & divergent.

(2) Application of curl. (3)Appication

on Sphere.

(4) Appication on Cone.

(5) Appication onCylinder.

Reference Book:
Excel Guide for Finite Mathematics and Applied Calculus by Revathi Narasimhan
Publisher: Houghton Mifflin Company; 7 edition

Course :PC MAT-111

Instructions: Strictly follow the instructions given by examiner(s)

Draw the graphs any two out of three from

1. unit-I (10 Marks)
2. Attempt any two out of three from unit-II (10 Marks)
3. Attempt any two out of three from unit-III (10 Marks)
4. Attempt any two out of three from unit-VI (10 Marks)
5. (a) Viva (5 Marks)
   (b) Journal (5 Marks)

Subject Elective Course : Code ESMAT-11 [Set Theory & Functions]

Unit-I : Set Theory Sets and subsets , Basic set operations , Sets of numbers ,Product sets , Indexed sets , Union and intersection of indexed collections , Principle of duality , Bounded and unbounded sets.

Unit-II : Functions Definitions, Operators , transformations , Range , one-one fu^{ns} , onto fu^{ns} , identity fu^{n} , constant fu^{n} , composition of fu^{ns} (product of fu^{ns}) , Inverse of fu^{n} , Set fu^{ns} , Real valued fu^{ns} , algebra of real valued fu^{ns} , characteristic fu^{n} .

References :

1. Set Theory & Related Topics. By. Seymour Lipschutz McGraw-Hill book Company , Singapur
2. Business Mathematics By. D.C.Sancheti & V.K.Kapoor,Publication : S Chand & sons, New Delhi.

I/c. Registrar
Hemchandracharya
North Gujarat University
PATAN

BOTANY

I/c. Registrar
Hemchandracharya
North Gujarat University
PATAN

HEMCHANDRACHARYA NORTH GUJARAT UNIVERSITY, PATAN

B.Sc. Programme with 144 credits

CBCS-Semester-Grading Pattern

w.e.f. June-2011

General Pattern/Scheme of study components along with credits for Science faculty.

Part/Class	Subject code	Study Components	Instruction Hrs/ Week	Examination			Credit
				Internal	Uni. Exam	Total	
B.Sc. Semester -I		**Semester-I**					
		Core Compulsory (CC) Course					
	CC-I-1	Core Course-I (Paper-1)	4	30	70	100	4
	CC-II-1	Core Course-II (Paper-1)	4	30	70	100	4
	CC-III-1	Core Course-III (Paper-1)	4	30	70	100	4
		Practical Core (PC) Course					
	PC-I-1	Practical Core Course-I (Paper-1)	4		50	50	2
	PC-II-1	Practical Core Course-II (Paper-1)	4		50	50	2
	PC-III-1	Practical Core Course-III (Paper-1)	4		50	50	2
		Foundation Course (FC)					
	FC-1	Foundation (Compulsory) course (Generic) - English (L.L.)	2	15	35	50	2
		Elective Course (E)					
	EG-1	Elective (**Generic**) Course -I	2		50	50	2
	ES-1	Elective (**Subject**) Course -I	2		50	50	2
			30	**105**	**495**	**600**	**24**
B.Sc. Semester -II		**Semester-II**					
		Core Compulsory (CC)Course					
	CC-I-2	Core Course-I (Paper-1)	4	30	70	100	4
	CC-II-2	Core Course-II (Paper-1)	4	30	70	100	4
	CC-III-2	Core Course-III (Paper-1)	4	30	70	100	4
		Practical Core (PC) Course					
	PC-I-2	Practical Core Course-I (Paper-1)	4		50	50	2
	PC-II-2	Practical Core Course-II (Paper-1)	4		50	50	2
	PC-III-2	Practical Core Course-III (Paper-1)	4		50	50	2
		Foundation Course (FC)					
	FC-2	Foundation (Compulsory) course (Generic) - English (L.L.)	2	15	35	50	2
		Elective Course (E)					
	EG-2	Elective (**Generic**) Course -II	2		50	50	2
	ES-2	Elective (**Subject**) Course -II	2		50	50	2
			30	**105**	**495**	**600**	**24**

I/c. Registrar
Hemchandracharya
North Gujarat University
PATAN

HEMCHANDRACHARYA NORTH GUJARAT UNIVERSITY, PATAN

CBCS - Semester - Grading Pattern

B. Sc. :: BOTANY :: SEMESTER-I

CC BOT-111

(in force from June 2011)

Unit-I : Cell Biology

- The Cell theory, types of cells on the basis of Nucleus (Akaryota, Prokaryota & Eukaryota)
- Size, Shape & Number of Eukaryotic cells
- Comparison of ultra-structure of typical Prokaryotic & Eukaryotic cell-Plant cell and Animal cell
- Structure & function of Plasmodesmata
- Nucleus: history, distribution, parts, ultra-structure & function
- Chromosome: shape depends upon the position of centromere, ultra-structure and functions

Unit-II : Biology of Cryptogams (Algae & Fungi)

- General characters of Algae
- Economic importance of Algae (as food, fodder and fertilizer)
- Life history of *Spirogyra* with reference to
  - Systematic position with reasons (according to Smith)
  - Habit and Habitat, Vegetative structure and Reproduction
- General characters of Fungi
- Economic importance of Fungi (as food and medicine)
- Life history of *Mucor* with reference to
  - Systematic position with reasons (according to Ainsworth)
  - Habit and Habitat, Vegetative structure and Reproduction

Unit-III : Plant Anatomy

- General characteristics and functions of various kinds of plant tissues:
  - Meristematic, Simple tissues : Definition, (parenchyma, collenchyma and sclerenchyma fibres) and Complex tissues: Xylem, (thickenings in vessels / tracheids) Phloem: sieve tube
- Definition of Epidermal, Ground and Vascular tissue system
- Epidermal tissue system:
  - Uniseriate and Multiseriate epidermis
  - Types of Stomata (Dicot-Hibiscus & Monocot-Maize)
  - Types of Trichomes (Unicellular-stellate; Multicellular-unbranched & branched; Glandular)
  - Motor cells in Maize leaf
  - Cystolith in Banyan leaf
  - Sphaeroraphides in *Nerium* leaf
  - Velamen tissue in aerial root of Orchid
  - Structure and function of Periderm and Lenticel (Tinospora)

Unit-IV : Environmental Biology

- Definition, scope and Significance of Ecology for human
- Climatic factors: **Light:** Introduction, Light relation in plant. **Temperature:** Introduction, variation in temperature and its effect on distribution of plants
- Biotic factors: Positive Interrelationship
  - Symbiosis -Mutualism (Lichens, Symbiotic N_2 fixation, Mycorrhizae)
  - Commensalism - Epiphytes: Orchid
  - Negative Interrelationship
    - Exploitation-Parasitism(*Cuscuta*, *Loranthus*)
    - Predation(*Nepenthus*,*Utricularia*)
- Ecosystem Ecology: Definition, Kinds, Structure of ecosystem
- Ecological Pyramids: Pyramids of Number, Biomass and Energy

HEMCHANDRACHARYA NORTH GUJARAT UNIVERSITY, PATAN
CBCS - Semester - Grading Pattern
B.Sc. :: BOTANY Practical :: SEMESTER-I
PC BOT-111
(in force from June 2011)

Unit-I : Cell Biology

- To study the various shape of cells through permanent / temporary slides:
  Amoeba, *Paramoecium*, Human RBC, Nerve cell, *Spirogyra* and Onion leaf scale.
- To study the various types of cells on the basis of Nucleus through micrographs / charts:
  Akaryota - Bacteriophage, Prokaryota - Cyanophycean cell & Eukaryota - typical Animal & Plant cell
- To study the Structure of Plasmodesmata through permanent / temporary slide from Date Palm seed
- To study the ultrastructure of Nucleus and Chromosomes through micrographs (SEM, TEM) / charts

Unit-II : Biology of Cryptogams (Algae & Fungi)

- To study the Life history of *Spirogyra* through:
  Mountings - Thallus and Reproductive structure
  Permanent Slides of - Thallus and Reproductive structure
- To study the Life history of *Mucor* through:
  Specimen - Bread / Roti with *Mucor*
  Mountings - Mycelium and Asexual and sexual Reproductive structures
  Permanent Slides of - Mycelium and Asexual and sexual Reproductive structures

Unit-III : Plant Anatomy

- To study the various types of Simple (parenchyma, collenchyma and sclerenchyma) and Complex tissues (thickenings in vessels / tracheids and sieve tube) from Sunflower and *Cucurbita* stems (T.S. and L.S.) through fresh and permanent preparations.
- To study the Epidermal tissue system through permanent / temporary slides:
  Uniseriate (Sunflower leaf) and Multiseriate (Banyan / *Nerium* leaf) epidermis
  Stomata structure (Dicot-*Hibiscus* & Monocot-Maize)
  Trichomes [Unicellular-stellate (*Abutilon*); Multicellular-unbranched (*Tridax*) & branched (*Withania*); Glandular (*Datura*)
  Motor cells in Maize leaf
  Cystolith in Banyan leaf
  Sphaeroraphides in *Nerium* leaf
  Velamen tissue in aerial root of Orchid
  Permanent slides of Periderm and Lenticel structure- *Tinospora*

Unit-IV : Environmental Biology

- To study of Biotic factors through specimens/charts/photographs
  Positive Interrelationship
  Symbiosis - Mutualism: Lichens, Root nodules, Mycorrhizae
  - Commensalism: Epiphytes - Orchid
  Negative Interrelationship
  Exploitation - Parasitism (*Cuscuta*, *Loranthus*)
  - Predation (*Nepenthus*, *Utricularia*)
- Charts / Photographs: Pyramids (Number, Biomass and Energy)

HEMCHANDRACHARYA NORTH GUJARAT UNIVERSITY, PATAN
CBCS - Semester - Grading Pattern
B.Sc. :: BOTANY Practical :: SEMESTER-I
PC BOT-111
(in force from June 2011)

Guideline for arrangement of specimens

1. Specimen A: *Spirogyra / Mucor*
2. Specimen B: *Spirogyra / Mucor*
3. Specimen C: Sunflower stem for Parenchyma / Collenchyma / Sclerenchyma

   OR

   Specimen C: *Cucurbita* stem for Thickenings in vessels / Sieve tube
4. Specimen D: Epidermal tissue system
   - Uniseriate: Sunflower leaf
   - Multiseriate: Banyan / *Nerium* leaf
   - Stomata structure: Dicot - *Hibiscus* and Monocot - Maize
   - Trichomes: Unicellular- *Abutilon*
     - Multicellular- *Tridax / Withania*
     - Glandular- *Datura*
   - Motor cells in Maize leaf
   - Cystolith in Banyan leaf
   - Sphaeroraphides in *Nerium* leaf
   - Velamen tissue in aerial root of Orchid
5. Identify and describe the peculiarities/structure observed in given specimens:
   a. Shape of cells (as per theory syllabus)
   b. Type of cell (on the basis of nucleus: Bacteriophage/Cyanophycean /Plant /Animal)
   c. Nucleus / Chromosome shape (as per theory syllabus)
   d. Periderm / Lenticel (Permanent slide- *Tinospora*)
   e. Symbiosis (Lichen / Root nodules / Micorrhizae)
   f. Exploitation (*Cuscuta* / *Loranthus* / *Utricularia* / *Nepenthus*)
   g. Ecological Pyramids (Number / Biomass / Energy)

HEMCHANDRACHARYA NORTH GUJARAT UNIVERSITY, PATAN
CBCS - Semester - Grading Pattern
B. Sc. :: BOTANY Practical :: SEMESTER-I
PC BOT-111
(in force from June 2011)

Date: Place:

Time: **5** Hrs Total Marks: **50**

Instructions: Strictly follow the instructions given by examiner(s).

1. Identify and describe structural peculiarities observed in the given plant specimen **A.** **07**
2. Make a temporary preparation of the reproductive organ from the given plant specimen **B**. Draw the neat and labeled diagram of it and show your preparation to the examiner. **07**
3. Take T.S. / L.S. of the given plant specimen **C** and, make the temporary preparation (slide). Stain if needed and, show_____ to the examiner. **07**
4. Make the temporary preparation (slide) of epidermal tissue structure from the given plant specimen **D.** Stain if needed and, show_____ to the examiner. **07**
5. Identify and describe the peculiarities/structure observed in given specimens: **14**

   a. Shape of cells (as per theory syllabus)

   b. Type of cell (on the basis of nucleus)

   c. Nucleus / Chromosome shape

   d. Periderm / Lenticel

   e. Symbiosis (Lichen / Root nodules / Micorrhizae)

   f. Exploitation (*Cuscuta / Loranthus / Utricularia / Nepenthus*)

   g. Ecological Pyramids

6. a. *Viva-voce* **04**

   b. Journal **04**

I/c. Registrar
Hemchandracharya
North Gujarat University
PATAN

HEMCHANDRACHARYA NORTH GUJARAT UNIVERSITY, PATAN

CBCS - Semester - Grading Pattern

List of Elective (Subject) Courses

(in force from June 2011)

Credits-2

Botany	Biotechnology
Wood Anatomy	Biodiversity
Water quality analysis	Biological evolution
Environment study	Biocomputing
DNA: the Molecule of life	Professional practice in Biotechnology
Biodiversity	Microbial ecology
Carbon credit	Clinical Biotechnology
Remote sensing	
Plant Breeding	
Plant Tissue Culture	
Horticulture	
	Zoology
Enzyme Technology	Zoo maintenance
Tissue culture technology	Museum curators
Waste Management	Pest control
Water Harvesting and conservation	First Aid and emergency services
Clinical Microbiology	Disaster management
Industrial Microbiology	Biodiversity
Bio instrumentation	Food and adulteration
r-DNA technology	Forensic science
Sustainable Agriculture	
Pollution Microbiology	

I/c. Registrar
Hemchandracharya
North Gujarat University
PATAN

HEMCHANDRACHARYA NORTH GUJARAT UNIVERSITY, PATAN

CBCS - Semester - Grading Pattern

B. Sc. :: BOTANY :: SEMESTER-I

Elective Course (Subject) :: ES BOT-111

Plant Tissue Culture

(in force from June 2011)

Credits-2

Unit-I Plant Tissue Culture-I

1. Introduction: Definition and Concept
2. History and Scope of Plant tissue culture
3. Laboratory design and layout- Washing, Store area, Preparation area and Culture room
4. Sterilization- Methods of Sterilization
5. Tools/Equipments (Principle and Operation)-Autoclave, LAF (Laminar Air Flow), pH meter, Balance, Incubator, Oven

Unit-II Plant Tissue Culture-II

1. Selection and Isolation of ex-Plant
2. Nutrient media- Preparation and Composition
3. Callus culture, Advantages and Applications
4. Micro-propagation
5. Biotechnological methods for Plant improvement

HEMCHANDRACHARYA NORTH GUJARAT UNIVERSITY, PATAN

CBCS - Semester - Grading Pattern

B. Sc. :: BOTANY :: SEMESTER-I

Elective Course (Subject) :: ES BOT-112

Plant Breeding

(in force from June 2011)

Credits-2

Unit-I Plant Breeding-I

1. Introduction: Aims and Objectives of Plant Breeding
2. Self-pollination and Cross-pollination methods
3. Selection-Methods of Selection in Plant Breeding for
   Self-pollinated plants
   Cross-pollinated plants

Unit-II Plant Breeding-II

1. Hybridization: Techniques and Tools
2. Hybridization: Methods of Hybridization in Plant Breeding for
   Self-pollinated plants
   Cross-pollinated plants
3. Hybrid Vigour

HEMCHANDRACHARYA NORTH GUJARAT UNIVERSITY, PATAN

CBCS - Semester - Grading Pattern
B. Sc. :: BOTANY :: SEMESTER-I
Elective Course (Subject) :: ES BOT-113

Horticulture

(in force from June 2011)
Credits-2

Unit-I Horticulture-I

1. Introduction: Aims, Objectives and Scope of Horticulture
2. Plant Propagation-Vegetative, Asexual and Sexual reproduction
3. Nursery Management

Unit-II Horticulture-I

1. Landscape: Principles, Types and Planning
2. Floriculture and its implements
3. Bonsai
4. Important Horticulture crops of Gujarat

I/c. Registrar
Hemchandracharya
North Gujarat University
PATAN

HEMCHANDRACHARYA NORTH GUJARAT UNIVERSITY, PATAN

CBCS - Semester - Grading Pattern B.Sc. Program

List of Elective (Generic) Courses

(in force from June 2011)

Credits-2

Elective (Generic) Course	
Semester-I	
Computer Skill-1	National Ethics
Human Society and Ethics	Indian Culture and Heritage
Society an Technology	Stress management
Indian Constitution	
Semester-II	
Environment science	Disaster management
Semester-III	
Computer Skill-II	Cultural heritage of Gujarat
Value Oriented education	Human resource development
Personality Development	
Semester-IV	
Basic computer applications	Presentation skills
Social ethics	Indian knowledge system
First aid and emergency care	
Semester-V	
Gandhi and phyloshopy	Library - a learning resource center
Indian religions	Handling of household equipments
Indian history	E-marketing (Telemarketing)
Indian geography	
Semester-VI	
Fundamental rights and duties	Hospitality
Vedic sciences	International relations
Indian Tribal Culture	

I/c. Registrar
Hemchandracharya
North Gujarat University
PATAN

MICRO-BIOLOGY

I/c. Registrar
Hemchandracharya
North Gujarat University
PATAN

DETAILED SYLLABUS

SEMESTER – I

MB – 01 FUNDAMENTALS OF MICROBIOLOGY 4 Credits (60 Hours)

Unit : I History of Microbiology (15 Hours)

1.1 Discovery of Microbial World : Theories of Biogenesis and Abiogenesis; Discovery of viruses

1.2 Contributions of scientists in the field of microbiology : Anton van Leeuwenhoek, Edward Jenner, Robert Koch, Louis Pasteur, Iwanowsky, Winogradsky, Beijerinck, Alexander Fleming, Selman Waksmann, Paul Ehrlich

1.3 Importance and applications of Microbiology in various fields

1.4 Golden era of Microbiology

Unit : 2 Microbiological Techniques - I (15 Hours)

2.1 Sterilization and disinfection techniques : Principles and methods of sterilization

2.2 Physical : Hot Air Oven, Pressure Cooker, Autoclave, Laminar Air Flow,

2.3 Chemical : Alcohol, Aldehyde, Phenol, Halogen, Hypochlorite, Fumigants, phenol coefficient

2.4 Radiation methods : UV rays, gamma rays, ultrasonic methods

Unit : 3 Microbiological Techniques - II (15 Hours)

3.1 Types of Stains & Staining techniques: Simple, Differential, Negative, Structural stains (Spore, Capsule, Flagella, Cell Wall, Metachromatic etc.);

3.2 Principles of Microscopiy: simple & compound

3.3 Bright field, Dark field, Phase contrast & Fluorescence Microscopy , Scanning and Transmission Electron Microscopy

Unit : 4 Pure culture Isolation and Preservation of Cultures (15 Hours)

4.1 Pure culture techniques – Enrichment culture, dilution plating, streak plate, spread plate and pour plate techniques, Micromanipulator

4.2 Preservation : Sub culturing, Oil overlay, Sand cultures, Storage at low temperature, Lyophilization, Liquid Nitrogen

4.3 Microbiological Media : Simple, Complex, Defined, Differential, Selective, Special

LAB – 1: (B. Sc. Sem. – I)

Fundamentals of Microbiology (Practical) : 2 Credits 30 Hours

1. Safety precautions to work in Microbiology Laboratory.
2. Preparation of culture media : Solid & Liquid
3. Sterilization techniques : Autoclaving, hot air oven and filtration
4. Isolation of single colony on solid media
5. Enumeration of bacterial numbers by serial dilution and plating
6 Light & compound microscopes and their handling
7. Microscopic observation of bacteria for Morphological characters
8. Calibrations of microscopic measurements (Ocular & stage micrometers)
9. Simple and differential staining (Gram staining), negative staining
10. Preservation of bacterial cultures

ZOOLOGY

I/c. Registrar
Hemchandracharya
North Gujarat University
PATAN

Detailed Curriculum for Zoology
SEMESTER I

Core Course: CC-Zoo 111: Invertebrate Zoology: I

Unit: I Taxonomy **15 hours**

- General Body Organization of Invertebrates: Germ Layers; Coelom, Symmetry; Segmentation
- Classification of following Phyla up to Class
  Protozoa, Porifera, Coelenteata, Platyhelminthes, Nementhelminthes

Unit-II Type Study **15 hours**

- **Leucosolenia:** Body wall; Reproduction; Canal system
- **Plasmodium**: Life cycle and pathogenesity
- **Hydra**: Ext.characters; Locomotion; Body wall; Reproduction
- **Ascaris**: Ext. characters; Digestive system; Reproductive system; Life cycle & pathogenesity

Unit-III CYTOGENETICS **15 hours**

- Animal cell structure
- **Nucleus**: Occurrence and Position; Structure: Nuclear membrane, Nuclear pores, function of Nuclear membrane chromatin fibre, Nucleolus (structure and function)
- **Chromosomes** : Structure and Types
- Cell Cycle & Mitotic division of cell
  - Practical Applications of Genetics
  - Laws of Mendelian genetics
  - Incomplete dominance and Complete dominance
  -Multiple alleles with reference to ABO Blood group in Humans

Unit-IV Economic Zoology **15 hours**

- Apiculture ,Sericulture,
- Pearl culture, Prawn Fisheries,
- Vermiculture

Hemchandracharya North Gujarat University PATAN

I/c. Registrar
Hemchandracharya
North Gujarat University
PATAN

Reference Books:

1. Economic Zoology**, Shukla**
2. Modern Textbook of Zoology INVERTEBRATES, R.L.Kotpal, Rastogi publication
3. INVERTEBRATE ZOOLOGY, P.S.Dhami & P.S. Dhami
4. Text book of Invertebrates, N Arumugam, Saras Publication
5. Non-chordata, E.L.Jordan and P.S.Varma, S.Chand & Co.
6. , ... , . .ણ બાડ
7. Cell Biology, C.B.Powar, Himalaya Books Pub.
8. Cell Biology, N. Arumugam, Saras Publication
9. Cytology, P.S. Varma, S.Chand & Co.Ltd.
10. Text books of Genetics, V.B. Rastogi, Kedarnath Ramnath, Meerat
11. Concept of Genetics, R.L.Kotpal, Rastogi Publication
12. Genetics, N.Arumugam, Saras Publication
13. A Text book of Genetics, R.P. Meyyan, Saras Publication

I/c. Registrar
Hemchandracharya
North Gujarat University
PATAN

Core Course: PC-Zoo 111: Practical Zoology I
(PRACTICAL for SEMESTER-I)

A. Classification of following specimens up to class

1. Protozoa: Amoeba; Paramoecium; Euglena; Plasmodium
2. Porifera: Leucosolenis; Hyalonema; Euspongia
3. Coelenterata: Hydra; Aurelia; Coral
4. Platyhelminthes: Planaria; Liver fluke; Tapeworm
5. Aschelminthes: Ascaris

B. Study of Permanent Slides

6. T.S. and L.S. of Leucosolenia
7. Hydra with Gonads (W.M. and T.S.)

C. Cytology (permanent slides)

8. Animal Cell Structure
9. Nucleus
10. Any chromosomes

D. Dissection and mounting of Ascaris

11. Reproductive system (female) and Mounting of Egg
12. Digestive system

E. Mitotic division of cell (Onion root tip)

F. Genetics:

13. Examples related to Laws of Mendel's : Monohybrid-3:1
    Dihybrid: 9:3:3:1
14. Examples related to Incomplete dominance and Co-dominance-1:2:1
15. Examples related to ABO blood groups

G. Economic Zoology

16. Apiculture: Life cycle of *Apis indica*
17. Sericulture: Life cycle of *Bombyx morii*
18. Specimens of Prawn and Pearl oyster

CHEMISTRY

I/c. Registrar
Hemchandracharya
North Gujarat University
PATAN

Hemchandracharya North Gujarat University. Patan.
F.Y.B.Sc.
Chemistry.(CC CH 101)
Semester: I

Unit : 1 (A) CHEMICAL BONDING

- Valence bond theory & its application
- Directional characteristics of covalent bond
- Various types of hybridization and shape of simple inorganic molecules
- V.S.E.P.R. theory for NH_3, H_2O
- M.O. Theory-Energy level diagram for homo nucleus diatomic molecules (N_2 and O_2) and hetero diatomic molecule (CO and NO)

(B) F–BLOCK ELEMENTS

- Lanthanide electronic configuration, Oxidation state
- Lanthanide contraction, Effect of lanthanide contraction
- Separation method
  (1) Solvent extraction methods
  (2) Ion Exchange Method

Unit : 2(A) STRUCTURE AND PROPERTIES

Factors affecting to the properties of organic molecule

- Intramolecular forces (dipol-dipol interaction, vander waals forces)
- Electromeric effect
- Inductive effect
- Resonance effect(draw resonating structures of Nitro benzene, Chlorobenzen, Phenoxide ion, Anillinium ion, Acetate ion)
- Hyper conjugation (o,p-directing effect of Alkyl group, Stability of Carbonium ion and Free radicals)

(B) REACTION MECHANISM

- Fission of Co-Valent bond (With atleast one example of each intermediates)
- Types of reagents.
- Types of organic reaction with mechanism.
- Substitution reactions (Nucleophillic & Electrophillic)
- Addition reactions (Nucleophillic & Electrophillic)
- Elimination reactions (E_1 & E_2)

I/c. Registrar
Hemchandracharya
North Gujarat University
PATAN

UNIT : 3 THERMODYNAMICS

- Thermodynamics (only introduction)
- System and surrounding- work & heat, state function, thermodynamic process, internal energy, enthalpy, free energy, maximum work function.
- First law of thermodynamics
- Heat capacity, specific and molar heat capacity, heat capacity at constant volume and pressure and their relationship
- Work done in adiabatic and isothermal reversible expansion of an ideal gas.
- Second law of thermodynamics
- Carnot cycle and its efficiency
- Concept of entropy ; entropy change for an ideal gas under different conditions, entropy change for mixture of ideal gases
- Gibbs-Helmholtz equation
- Want-hoff isotherm and isochors
- Numerical

Unit : 4 ANALYTICAL CHEMISTRY

- Introduction to Analytical Chemistry
- Classification of Classical and Electroanalytical Techniques.
- Literature of Analytical Chemistry(Names of Author and Publishers for Any Ten Books, Journals and Reviews)
- Criterion for Selection of analytical Techniques.
- Analytical Data Treatment
  - Error, Types of errors, Accuracy and Precission.
  - Statistical Terms :
    Mode, Average, Median, Deviation,
    Average Deviation, Relative Average Deviation,
    Standard Deviation & Coefficient of variance.
  - Q-Test for the rejection of result and related numericals.

I/c. Registrar
Hemchandracharya
North Gujarat University
PATAN

Hemchandracharya North Gujarat University. Patan.

F.Y.B.Sc.

Chemistry. (SE CH 101)

Semester : I

SUBJECT ELECTIVE PAPER

(Agricultural Chemistry)

Unit : 1 FERTILIZERS

- Plant Nutrients, Major Nutrients, Minor Nutrients, Trace Nutrients
- Definition of Fertilizer
- Classification of Fertilizer
- Synthesis of N Containing Fertilizer i.e. $(NH_4)_2SO_4$, $Ca(CN)_2$, and Urea
- Synthesis of P Containing Fertilizer i.e. Super Phosphate, Tripal Super Phosphate
- Mix Fertilizer

Unit : 2 INSECTICIDE

- Introduction
- Inorganic Insecticide
- Organic Insecticide
- Natural or Plant Insecticide
- Synthesis of DDT, BHC, Malathion.

Reference : Industrial Chemistry by B.K.Sharma.

: REFERENCE BOOKS :

Inorganic Chemistry

1. 'Source Book on Atomic Energy' by glastone, 1969.
2. 'Modern Inorganic Chemistry' by G.F.Liporni, ELBS, 4th edn, colling Educational, 1983.
3. 'Inorganic Chemistry' D.F.Shriver, P.W.Atkinss and C.H.Longford, 3 rd edn, ELPS Oxford University Press, 1999.
4. 'Nuclear and Redio Chemistry' by G fried lander, J.W.Kennedy, E.S.macias and J.M.Miller, 3rd edn, John wiley, 1981.
5. Essentials of Nuclear Chemistry' H.J.Arnical, 4th edn, New Age International, 1995.
6. 'Concise Inorganic Chemistry' J.D.Lee, 5th edn.
7. 'Inorganic Chemistry', D.F.Shriver, P.W.Atkinss, 3rd edn, Oxferd, 1999.
8. 'Concise Inorganic Chemistry' J.D.Lee, 4th edn, Champman and Hall ELBS, 1991.
9. 'Inorganic Chemistry' by A.G.Sharp, 3rd edn, ELBS, Longman, 1990.

I/c. Registrar
Hemchandracharya
North Gujarat University
PATAN

Organic Chemistry

1. 'Organic reaction and mechanism, P.S.Kalsi, New Age international Publishers.
2. Text book of organic Chemistry, P.S.Kalsi, New Age international Publishers.
3. Organic Chemistry Vol. I & II, S.M.Mukherji, S.P.Singh, R.P.Kapoor.
4. Reaction mechanism in Organic Chemistry, S.M.Mukhergi, S.P.Singh. 3rd edn, Macmillan.
5. Reaction Mechanism and Reagents in Organic Chemistry, Gurdeep R. Chatwal 4th edn, Himalaya Publication House.
6. Text book of Organic Chemistry, Arun Bahal, S.Chand.
7. Organic Chemistry, R.Morrison and R.Boyd, 6th edn, Pearson Education 2003.
8. Organic Chemistry, T.W.Graham Solomons, 4th edn, John Wilay, 1998.

Physical Chemistry

1. Advance Physical Chemistry by Gurdeepraj.
2. Physical Chemistry (Question and Answer) by R.N.Madan, G.D.Tuli, S.Chand.
3. Principal of Physical Chemistry by Puri, Sharma, Pathania.
4. Chemical Thermodynamics by R.P.Rastogi and R.R.Misra.
5. Nuclear Chemistry by C.V.Shekhar, Dominent-Publisher, New Delhi.
6. Essentials of physical Chemistry by B.S.Bahal, Arun Bahal, G.D.Tuli.
7. Physical Chemistry by P.W.Atkins, 5th edn, Oxferd 1994 7th edn-2002.
8. Physical Chemistry by R.A.Albert and R.J.Silby, John Wiley1995.
9. Physical Chemistry by G.H.Barrow, 5th edn, Mac Graw Hill, 1988, 6th edn, 1996.
10. Physical Chemistry by W.J.Moore, 4th edn, Orient Longmans 1969.

Analytical Chemistry

1. Fundamentals of Analytical Chemistry by Skoos & West.
2. Analytical Chemistry, Garry D.Christain.
3. Analytical Chemistry, Day & Underwood.
4. Analytical Chemistry by Lerry & Hergins.
5. Qualitative Analysis by A.I.Vogel, 5th edn.

Hemchandracharya North Gujarat University. Patan.

F.Y.B.Sc.

Chemistry Practical

Laboratory Course (LC CH 101)

Semester : I

This syllabus is to be completed by assigning two laboratory sessions per week, each of two hours. Total laboratory work is 60 hrs/semester (4 hrs/week) or 15 weeks.

The number of students in the laboratory batch should not exceed fifteen (15). The medium of instruction should be English in laboratory course.

1. **Inorganic Chemistry**

   Semi micro Analysis:-

   - Cation analysis; separation and identification of ions from group I, II, III-A, III-B, IV, V-A, V-B.
   - Anion analysis like

     Cl^- ,Br^- ,I^- , NO_3^- , NO_2^- , SO_4^{-2} , SO_3^{-2} , S^{-2} , CrO_4^{-2} , CO_3^{-2} , PO_4^{-3}

     (Water Soluble and insoluble).
   - Candidate should perform the analysis of at least 10 compounds.

2. **Standardization**

   1) Preparation of standard solution of succinic acid and standardization of NaOH/KOH solution.
   2) Preparation of standard solution of $Na_2S_2O_3$ and standardization of I_2 solution.
   3) Preparation of standard solution of EDTA and estimation of Ca^{+2}/Mg^{+2} in $CaCl_2/MgCl_2$ solution.
   4) Preparation of standard solution of Oxalic acid and standardization of $KMnO_4$ solution.
   5) Preparation of standard solution of $K_2Cr_2O_7$ and standardization of $FeSO_4$ solution.

3. **Demonstrations**

   - Preparation of standard stock solution by w/v method and their different dilutions.
   - Preparation of standard stock solution of HCl by v/v method and their different dilutions.

.

I/c. Registrar
Hemchandracharya
North Gujarat University
PATAN

BIO-
TECHNOLOGY

I/c. Registrar
Hemchandracharya
North Gujarat University
PATAN

Hemchandracharya
North Gujarat University
PATAN – 384 265

Syllabus According To CBCS Semester pattern

B. Sc. (Biotechnology) Syllabus

(Semester I & II)

(With Effect From June 2011)

I/c. Registrar
Hemchandracharya
North Gujarat University
PATAN

B. Sc. (Biotechnology)

(With effect from June 2011)

Semester I

Core Compulsory Course (CCC)
CBT 1-I Introduction to Biotechnology and Cell biology

Elective Course (EC) for Biotechnology

EBT 1 Biological evolution
EBT 1 Interdisciplinary relevance and Advancement of Biotechnology Semester II
Practical core course (PCC)

Semester II

Core Compulsory Course (CCC)
CBT 1-II Molecules of life

Elective Course (EC) for Biotechnology
EBT 1I Biodiversity
EBT 1I Biocomputing

Practical core course (PCC)

Hemchandracharya North Gujarat University PATAN

I/c. Registrar
Hemchandracharya
North Gujarat University
PATAN

Course pattern Subject :Biotechnology

Semester I
(First year B.Sc)

Semester	Paper	Instruction(hr per week)	Marks			Credits
			Internal	External	total	
	Core Course compulsory(CCC)					
1	Core course **CCC-I-1**	4	30	70	100	4
	Core course 2 **CCC-II-1**	4	30	70	100	4
	Core course 3 **CCC-III-1**	4	30	70	100	4
	Practical core course (PCC)					
	Practical core course (For biotechnology) **PCC-I-1**	4		50	50	2
	Practical core course2- **PCC-II-1**	4		50	50	2
	Practical core **PCC-III-1**	4		50	50	2
	Foundation Course (FC)					
	Foundation (Compulsory) course (Generic) - English (L.L.) **FCG-1**	2	15	35	50	2
	Elective Course (EC)					
	Elective (Generic) Course -I **ECG-1**	2		50	50	2
	Elective (Subject) Course -I **ECS-1**	2		50	50	2
		30	**105**	**495**	**600**	**24**

I/c. Registrar
Hemchandracharya
North Gujarat University
PATAN

B.Sc Biotechnology

SEMESTER l

SMESTER 1

Core Course Compulsory (CCC I-I)

CBT I -I

Introduction to Biotechnology and Cell Biology

Unit 1

1.1. Introduction to Biotechnology
1.2. Domains of Biotechnology
1.3. Applications of Biotechnology.: Agriculture ,Pharmaceutical, Environment, Fermentation
1.4. State, national and international level commercial opportunities in Biotechnology sector.

Unit 2

2.1. Microscopy: Fundamental of microscope, light microscopy and specimen preparation Bright field microscopy, Dark field microscopy.
2.2. Morphology of Bacterial cell: Size, shape and arrangement of bacterial cells ,External structure: Flagella, Pili, Fimbriae, Prosthacate
2.3. Boundary layer: Capsule, cell wall , cell membrane
2.4. Dormant forms: Spores and cyst

Unit 3

3.1. General organization of eukaryotic cell External structures: Flagella, cilia The cell envelope: boundary layer: cell wall, cell membrane
3.2. Internal structures: Cytoplasm, cytoskeleton, nucleus and nucleolus
3.3. Endoplasmic Reticulum, Golgi apparatus, Mitochondria Lysosome, Micro bodies (Glyoxysome and Peroxisome) Chloroplast,.
3.4. Chromosome: Size, shape, types and basic structure of chromosome, euchromatin and heterochromatin Giant Chromosome: Polytene chromosome and lamp brush chromosome

Unit 4

4.1. Cell cycle and overview of its regulation.
4.2. Mitosis and meiosis
4.3. Cell –Cell interaction
4.4. Endocytosis and exocytosis

Elective Course (EC)
EBT 1
Biological evolution

Unit 1

1.1. Theories of evolution: Charles Darwin, Lamark and Wallace
1.2. Chemical and biological evoluiion.,
1.3. Five kingdom classification system.
1.4. Understanding Species: Concept of Species and Speciation, Morphological and Biological explanation for species, Types of Speciation, Rates of Speciation

Unit 2

2.1. Isolation: Concept of Isolation, Mechanism of Isolation, Factor responsible for isolation, Types of Isolation.
2.2. Reproductive isolation, Types of Reproductive isolation, Role of Reproductive isolation in species formation.
2.3. Adaptation: Concept of Adaptation, Types of Adaptation
2.4. Adaptation and predators, adaptation and population.

Elective Course (EC)
EBT 1
Interdisciplinary relevance and Advancement of Biotechnology

Unit-1

1.1 What is interdisciplinary areas?
1.2 Biotechnology and relevance with Chemistry, Physics and Maths
1.3 Biotechnology and relevance with Agriculture,Medical,Pharmaceuticals
1.4 Advantage of Interdisciplinary subject

Unit-2

2.1. Advancement of Biotechnology in Crop Improvement for edible Vaccine and biopestiside.
2.2. Advancement of Biotechnology in Fermentation for organic acids
2.3. Advancement of Biotechnology in Health care for vacci
2.4. Advancement of Biotechnology in Sustainable development for Environment

Hemchandracharya North Gujarat University PATAN

I/c. Registrar
Hemchandracharya
North Gujarat University
PATAN

Semester I

Practical Core course (PCCI-I)

1. Introduction to lab environment-Safety measures and introduction to lab equipments, glass wares and accessories ,Disposal of laboratory waste and cultures
2. Microscopy : Simple, compound and phase contrast; Basic components of microscope and their working principle
3. Staining techniques :Simple-Monochrome and Negative Differential- Grams and Special-Capsule, Spore, Cell wall.
4. Study of Bacterial Motility
5. Micrometry: Measurement of given biological sample
6. Use of Heamocytometer and determination of cell densities of Yeast cell
7. Preparation of permanent slides showing different stages of cell division – Meiosis and Mitosis

PHYSICS

I/c. Registrar
Hemchandracharya
North Gujarat University
PATAN

હેમચંદ્રાચાર્ય ઉત્તર ગુજરાત યુનિવર્સિટી, પાટણ

પરિપત્ર ક્રમાંક- ૨૯૧ / ૨૦૧૧

વિષય : **બી.એસસી.–ભૌતિકશાસ્ત્ર ના સેમેસ્ટર/ સીબીસીએસ/ ગ્રેડીગ પેટર્નના સેમેસ્ટર–૧ અને ૨ ના નવા અભ્યાસક્રમમાં સુધારઓ અંગે..**

આ યુનિવર્સિટી સંલગ્ન સાયંસ કોલેજોના આચાર્યશ્રીઓને જણાવવાનું કે, જૂન–૨૦૧૧થી અમલમાં આવેલ બી.એસસી.–ભૌતિકશાસ્ત્રના સેમેસ્ટર/ સીબીસીએસ/ ગ્રેડીગ પેટર્નના સેમેસ્ટર–૧ અને ૨ ના નવા અભ્યાસક્રમમાં ભૌતિકશાસ્ત્ર વિષયની અભ્યાસ સમિતિના ચેરમેનશ્રી ધ્વારા સૂચવવામાં આવેલ સામેલ પરિશિષ્ટ પ્રમાણેના સુધારાઓની નકલ અમલ સારૂ આ સાથે મોકલી આપવામાં આવે છે. જેની સબંધિતોને જાણ કરવા વિનંતી છે.

આ બાબતની અધ્યાપકશ્રીઓ તથા વિધાર્થીઓને આપના સ્તરેથી જાણ કરવા વિનંતી છે.

કુલસચિવવતી

બિડાણ : ઉપર મુજબ.

નં.–એકે/અસ/૬૭૪૦ /૨૦૧૧
યુનિવર્સિટી રોડ, પો.બો. નં.– ૨૧
પાટણ. –૩૮૪ ૨૬૫. (ઉ. ગુ.)
તારીખ : ૭ /૧૦/૨૦૧૧

પ્રતિ,
૧. સંલગ્ન સાયંસ કોલેજોના આચાર્યશ્રીઓ
૨. ડો.બી.એલ.પૂંજાણી (ડીનશ્રી–વિજ્ઞાન વિધાશાખા)શ્રીએસ.એમ.પંચાલ સાયંસ કોલેજ, કોલેજ કેમ્પસ,તલોદ.જિ.– સાબરકાંઠા
૩. પરીક્ષા નિયામકશ્રી, હેમચંદ્રાચાર્ય ઉત્તર ગુજરાત યુનિવર્સિટી, પાટણ (પાંચ નકલ)
૪. ગ્રંથપાલશ્રી, હેમચંદ્રાચાર્ય ઉત્તર ગુજરાત યુનિવર્સિટી, પાટણ.
૫. ઈન્ચાર્જશ્રી, કોમ્પ્યુટર(રીઝલ્ટ) સેન્ટર, હેમચંદ્રાચાર્ય ઉત્તર ગજરાત યુનિવર્સિટી, પાટણ. તરફ પરિણામ તથા વેબ સાઈટ અર્થે.
૬. પ્રવેશ પ્રશાખા (એકેડેમિક), હેમચંદ્રાચાર્ય ઉત્તર ગુજરાત યુનિવર્સિટી, પાટણ.
૭. મુખ્ય હિસાબી અધિકારીશ્રી (મહેકમ),હેમચંદ્રાચાર્ય ઉત્તર ગુજરાત યુનિવર્સિટી, પાટણ. તરફ–પરિપત્રની ફાઈલ અર્થે.

I/c. Registrar
Hemchandracharya
North Gujarat University
PATAN

HEMCHANDRACHARYA
NORTH GUJARAT UNIVERSITY
PATAN-384 265

U.G. (B. Sc.) Programme

CBCS :: Semester :: Grading Pattern

With effect from: June 2011

Faculty

[redacted]

Subject

Physics

B.Sc.

Semesters: I & II

Total Pages: **1 to 21**

Submitted on

Date: 30/06/2011

I/c. Registrar
Hemchandracharya
North Gujarat University
PATAN

HEMCHANDRACHARYA NORTH GUJARAT UNIVERSITY, PATAN

B.Sc. Programme with 144 credits

CBCS-Semester-Grading Pattern

w.e.f. June-2011

General Pattern/Scheme of study components along with credits for Science faculty.

Part/Class	Course	Study Component	Instruction Hrs/ Week	Examination			Credit
				Internal	Univ. Exam	Total	
Sem –I B.Sc.		**Semester-I**					
		Core Compulsory (CC) Course					
	CC-I-1	Core Course-I (Paper-1)	4	30	70	100	4
	CC-II-1	Core Course-II (Paper-1)	4	30	70	100	4
	CC-III-1	Core Course-III (Paper-1)	4	30	70	100	4
		Practical Core (PC) Course					
	PC-I-1	Practical Core Course-I (Paper-1)	4		50	50	2
	PC-II-1	Practical Core Course-II (Paper-1)	4		50	50	2
	PC-III-1	Practical Core Course-III (Paper-1)	4		50	50	2
		Foundation Course (FC)					
	FC-1	Foundation (Compulsory) course (Generic) - English (L.L.)	2	30	70	100	2
		Elective Course (E)					
	EG-1	Elective (Generic) Course –I	2		50	50	2
	ES-1	Elective (Subject) Course –I	2		50	50	2
			30	**120**	**530**	**650**	**24**
Sem-II B.Sc.		**Semester-II**					
		Core Compulsory (CC)Course					
	CC-I-2	Core Course-I (Paper-1)	4	30	70	100	4
	CC-II-2	Core Course-II (Paper-1)	4	30	70	100	4
	CC-III-2	Core Course-III (Paper-1)	4	30	70	100	4
		Practical Core (PC) Course					
	PC-I-2	Practical Core Course-I (Paper-1)	4		50	50	2
	PC-II-2	Practical Core Course-II (Paper-1)	4		50	50	2
	PC-III-2	Practical Core Course-III (Paper-1)	4		50	50	2
		Foundation Course (FC)					
	FC-2	*Foundation (Compulsory) course* (Generic) - English (L.L.)	2	30	70	100	2
		Elective Course (E)					
	EC-2	*Elective (Generic) Course -II*	2		50	50	2
	ES-2	Elective (Subject) Course –II	2		50	50	2
			30	**120**	**530**	**650**	**24**

I/c. Registrar
Hemchandracharya
North Gujarat University
PATAN

Corrections in Syllabus

There are few corrections in UG B.Sc. CBCS Physics syllabus of Sem -I & II

(Effective from June-2011)

Corrections are as under:

Page-1

Correction in14th line

Total pages: 1 to 21 instead of 1 to 23

Page-13

Correction in 4th line

CC PHY-201 instead of CC PHY-103

Replacement of pages:

Pages: - 5, 12 and 17 to 23 by new pages 5, 12 and 17 to 21.

(K.K. Patel)
Chairman
B.O. S. Physics, HNGU-Patan

Date: 03/10/2011

Corrected syllabus is attached here with.

I/c. Registrar
Hemchandracharya
North Gujarat University
PATAN

HEMCHANDRACHARYA NORTH GUJARAT UNIVERSITY, PATAN

B.Sc.Semester-I

PC PHY-101

LABORATORY EXPERIMENTS

1. Damping coefficient, Relaxation and quality factor in the damped motion of a simple Pendulum.
2. M.I. of a Fly wheel.
3. Verification of Steafan's law using A.C.Source.
4. Arrangement of Spectrometer for parallel rays using Schuster method and clibration of spectrometer.
5. Refractive index of liquid using convex lens.
6. Study of Resonator.
7. Determination of the capacity 'c' of condenser.
8. Study of the series resonance with frequency variation.
9. P-N Junction diode as Half Wave Rectifier (i) Without filter (ii) With Series inductor Filter (iii) With Shunt Capacitor Filter. Calculation of percentage of regulation.
10. V-I characteristics of Zener diode and its use as Voltage regulator.
11. Verification of Thevenin's theorem.
12. Characteristics of common Emitter Transistor.

=*=*=*=

Note:- group-I & II merge [illegible]. Sem-II [illegible]

I/c. Registrar
Hemchandracharya
North Gujarat University
PATAN

3

HEMCHANDRACHARYA NORTH GUJARAT UNIVERSITY, PATAN

CBCS - Semester - Grading Pattern

B. Sc. :: PHYSICS :: SEMESTER-I

PC PHY-201

(in force from June 2011)

LABORATORY EXPERIMENTS

1. Bar Pendulum : Determination of 'K' and 'g'
2. Melde's Experiment.
3. Find out Refractive index of prism using spectrometer.
4. To determine the ratio of magnetic moments of two magnets by using vibrational magnetometer.
5. To determine the magnetic moment of a given Bar magnet using deflection magnetometer in Gauss A and B position.
6. Determination of self inductance 'L' of Inductor.
7. Study of parallel resonance with frequency variation.
8. Study of transformer.
9. P-N Junction diode as Full Wave Rectifier (i) Without filter (ii) With Series inductor Filter (iii) With Shunt Capacitor Filter. Calculation of percentage of regulation.
10. Bridge Rectifier (i) Without filter (ii) With Series inductor Filter (iii) With Shunt Capacitor Filter. Calculation of percentage of regulation.
11. Verification of Maximum power transfer theorem.
12. Decay of Potential across condenser.

=*=*=*=

Note : group - I & II merge ... Sem - III ...

I/c. Registrar
Hemchandracharya
North Gujarat University
PATAN

HEMCHANDRACHARYA NORTH GUJARAT UNIVERSITY, PATAN

CBCS - Semester - Grading Pattern

List of Elective (Subject) Courses for Sem-I & II

(in force from June 2011)

1. Instrumentation Measurement and analysis
2. Nuclear Energy
3. Electronic circuit elements and Energy Sources

HEMCHANDRACHARYA NORTH GUJARAT UNIVERSITY, PATAN

CBCS - Semester - Grading Pattern

B. Sc. :: PHYSICS :: SEMESTER-I & II

ES PHY-01

(in force from June 2011)

Instrumentation Measurement and analysis

UNIT-I:

Vernier Calipers: Introduction, Theory, Figure, Description of the instrument, Detail study of Least count, Errors, Positive error, negative error, Determination of magnitude of positive and negative errors.

Micrometer Screw: Introduction, Theory, Figure, Description of the instrument, Definition of pitch and its determination, study of least count, Meaning of the error and explanation of positive and negative errors. Determination of positive and negative errors. Method of taking observation with the help of Micrometer Screw.

Spherometer : Introduction, Theory, Figure, Description of the instrument, To determine the pitch of the screw, To determine the least count of the spherometer, Zero error, Derivation of the formula for the radius of curvature of a curved surface.

UNIT-II

Wheastone Bridge: Introduction, Theory with figure, The figure of meter bridge used in laboratory, construction of Meter bridge.

Post-Office box: Introduction, Theory, Circuit Diagram, Theoretical Circuit diagram, explanation of working with necessary formula.

Construction of Galvanometer: Introduction, Theory, Sensitivity and Figure of Merit of Galvanometer.

Spectrometer: Introduction, Construction and explanation of three main parts of Spectrometer, Mercury Discharge lamp, Sodium Discharge lamp, The adjustment, leveling and the method of recording the observation of Spectrometer.

I/c. Registrar
Hemchandracharya
North Gujarat University
PATAN

HEMCHANDRACHARYA NORTH GUJARAT UNIVERSITY, PATAN

CBCS - Semester - Grading Pattern

B. Sc. :: PHYSICS :: SEMESTER-I & II

ES PHY-02

(in force from June 2011)

Nuclear Energy

UNIT-I

Mechanism of Nuclear Fission, Fission Cross sections, Fission reactors, Fission Rate & reactor Power, Fission neutrons and gamma rays, prompt neutrons, delayed neutrons, fission gamma rays, Fission products, Amounts and activities of fission products, Fission–product activity after shutdown, Heat generation after shutdown

UNIT-II

Nuclear Fusion – Thermonuclear reactions – Energy production in stars. Fundamental interactions & elementary particles, Strong, Weak & Electromagnetic interactions.

Books:

- Nuclear Physics : Theory and Experiments, R. Roy and B.P. Nigam, Wiley Eastern.
- Physics of Nuclei and Particles, P. Marmier and E. Sheldon, Vol.1, Academic Press Physics of the Nucleus, M.A. Preston Addision Wesle

I/c. Registrar
Hemchandracharya
North Gujarat University
PATAN

HEMCHANDRACHARYA NORTH GUJARAT UNIVERSITY, PATAN
CBCS - Semester - Grading Pattern
B. Sc. :: PHYSICS :: SEMESTER-I & II
ES PHY-03
(in force from June 2011)

Electronic circuit elements And Energy Sources

UNIT- I PASSIVE CIRCUIT ELEMENT

(a) RESISTOR

Generals(6.1),Resistor type, Wire wound resistor, Carbon composition resistor, Carbon film resi. , *Cermete film resi.* , *Metal film resi.*, *Power resi.* , *Value tolerance* , *Variable resistor* , Potentiometer and Rheostats , Fusibal resi. , Resistor color , Resi. Colour band , Resi under ten ohm , Resi. Troubles ., Checking resistor with ohmmeter.

(b) INDUCTOR

Inductor , Comparison of different coils , Inductance of an inductance , Another definition *of inductance, Mutual inductance, Coefficient of coupling, Variables inductors ,Inductor in series* and parallel without M , Series combination with m , Stray inductance , Energy storage magnetic field, DC Resistance of coils ,

(c) CAPACITOR

Capacitors , Capacitor connect to battery , Capacitance , Fators controlling capacitance , *Type of Capacitors* , *Fixed Capacitor* , *Variable capacitors* , *Voltage rating of capacitors* , *Stray* circuit cap. Likage resistance , Troubles Capa. , Chacking capa. With ohm meter ,

UNIT—II ENERGY SOURCES

(a) CELLS AND BATTERY

Primary and Secondary cells and Batterys , Voltage and current of cell , Cell life , *Different type of dry cells* , *Carban zink cell* , *Alkaline cell* , *Manganese alkaline cell* , *Nickal* cadmium cell , , Mercury cell , Silver oxide cell ,Lead acide cell , Battery rating , Testing dry cell , Photo electric cell , Solar cell

(b) TRANSFORMER

Transformer working , Transformer impedance, Can a Trans. Operate on DC , RF Shilding , Auto Transformer

Book- Basic Electronics by B. L. Tharaja , Pub. S. Chand & Compny 3rd Edition

I/c. Registrar
Hemchandracharya
North Gujarat University
PATAN

HEMCHANDRACHARYA NORTH GUJARAT UNIVERSITY, PATAN

CBCS - Semester - Grading Pattern

List of Elective (Generic) Courses

(in force from June 2011)

Credits-2

Elective (Generic) Course	
Semester-I	
Computer Skill-1	National Ethics
Human Society and Ethics	Indian Culture and Heritage
Society an Technology	Stress management
Indian Constitution	
Semester-II	
Environment science	Disaster management
Semester-III	
Computer Skill-II	Cultural heritage of Gujarat
Value Oriented education	Human resource development
Personality Development	
Semester-IV	
Basic computer applications	Presentation skills
Social ethics	Indian knowledge system
First aid and emergency care	
Semester-V	
Gandhi and phyloshopy	Library - a learning resource center
Indian religions	*Handling of household equipments*
Indian history	E-marketing (Telemarketing)
Indian geography	
Semester-VI	
Fundamental rights and duties	Hospitality
Vedic sciences	international relations
Indian Tribal Culture	

21 વિષયોની યાદી કરવા બાબત

I/c. Registrar
Hemchandracharya
North Gujarat University
PATAN

HOME-

SCIENCE

I/c. Registrar
Hemchandracharya
North Gujarat University
PATAN

F.N. – 101 Fundamentals of Food and Nutrition (Core)

Objectives:

1) To aware the students about afferent food groups and major foods.
2) To acquaint the students about the different nutrients of the food and its sources.
3) To aware the students about deficiencies of different nutrients, its effect on body, treatment.

Unit – 1

(A) Introduction of food and nutrition.

- Definition of food, classification of food, functions of food, food as a source of nutrients.
- Definition of nutrition, nutrient, Health sign of good and poor nutrition, about problems related to nutrition.

(B) Basic food groups.

- Cereals and pulses.
- Milk and milk products, vegetables and fruits.
- Sugar and Jaggery, Meat, Fish, Poultry, Condiments and spices
  (their nutrient contribution)

Unit – 2

(A) Carbohydrates

- Classification
- Functions of carbohydrates
- Importance sources of carbohydrates and its requirement.

(B) Lipids

- Classification and functions
- Properties and rancidity of fat.
- Sources and requirement and deficiency of fat.

Unit – 3

(A) Protein

- Definition, chemical composition, classification and function of protein, Amino acids classification, essential amino acids and non essential amino acids.
- Nutritional significance of Amino acids, sources and requirement of protein and deficiency of protein.

(B) Energy

- Definition and unit of energy, energy yielding food factors, energy requirement, determination of energy by bomb calorimeter, gross energy value of food.
- Physiological energy value of food, Basal metabolism, definition, standard for BMR, factors affecting BMR, determination of BMR by Benedicts and both apparatus, determination of energy metabolism during work by max plank respirometer.

Unit – 4

(A) Vitamins & Minerals

- Classification and general functions of vitamins and Minerals.
- Fat soluble vitamins A,D,E,K and deficiency diseases of fat soluble vitamins.
- Water soluble vitamin B_1, B_2, B_6, deficiency diseases of water soluble vitamin.
- Sources, Requirement, Functions and Deficiency of Calcium, Phosphorus, Iron, Iodine.

Practical:

- Preparation of different nutrient rich recipe.
- Planning and preparation of carbohydrate rich diet.
- Planning and preparation of protein rich diet.
- Planning and preparation of energy rich diet.
- Planning and preparation of vitamin D rich diet.
- Planning and preparation of vitamin B_1 and B_2 rich diet.
- Planning and preparation of vitamin C rich diet.
- Planning and preparation of vitamin calcium rich diet.
- Planning and preparation of vitamin Iron rich diet.

References:

1) Dr. M. Swaminathan Essentials of food & nutrition Vol. I published by the Banglore Printing and Publishing Co. Ltd. No. 88, Mysore road, Banglore.
2) Mudambi S. R. and M.V Rajgopalan, Fundamentals of food and Nutrition, Wavey estern Ltd. 1983.
3) The rov well Williams, essentials of nutrition and Diet therapy, fifth Glition, Tinu mirror / Mospy company, westline industrial prive, St. Louis Misouri – 1990.
4) Hand book of food preparation CFTR1.
5) E. Gopalan; B.V ramsastri, nutritive value of Indiam foods, national institute of nutrition, Indian council of Medical Researal, Hyderabad – 7.

RM – 102 Introduction to Family Resource Management (Core)

Objectives:

1) To help students in learning meaning and various concepts of Home management.
2) To help students learn the basic process of management and its application to facilitate good management.
3) To help students learn various roles and responsibilities of good home maker.

Unit – 1

(A) – Introduction to family.

- Stages of family life cycle.

(B) - Introduction to Home management.

- Definition and purpose.
- Obstacles in home management.

Unit – 2

(A) Management process.

- Importance
- Steps – Planning, organization, directing evaluation and controlling.

(B) Qualities of good Home maker

- Roles and Responsibilities of good home maker.

Unit – 3

(A) Factors motivating management.

- Value – Importance, classification.
- Standards – Definition, classification.

(B) Goal – Definition, importance and classification.

Unit – 4

(A) Family Resource.

- Definition and classification
- Characterizations of resource

(B) Time as a resource, money as a resource and energy as a resource Introduction.

I/c. Registrar
Hemchandracharya
North Gujarat University
PATAN

Phy – 103 Elementary and Applied physics (Core)

Objective:

(1) To give knowledge about physical unit & unit system.

(2) To provide basic understanding of application of physics in Home Science.

(3) To aware students on all the necessary rules and laws of physics which are required to be known to home science students.

Unit – 1

- Introduction: - Meaning, importance, branches and scope.
- Physical quantities, its units and unit systems.
- Motion:- basic concepts related to motion new tons laws of motion.
- Force:- Introduction, classification
- Common understanding of density, Mass, Weight.

Unit – 2

- Work, power & energy.
  Definition, unit, types of energy conservation of energy.
- Heat & temperature :
  Meaning, measurement.
- Heat conduction, expansion.
- Specific and latent heat.
- Sound and waves:
- Types / classification and properties, Infrasonic sound, ultrasonic sound its use, echo.

Unit – 3 Light

- Nature, properties of light.
- Reflection, reflection of light through lens, prism and mirror.
- Dispersion of light.
- Colours: Basic colours, spectra, rain bow.
- Electricity and Magnetism.
- Concepts related to magnetism and electricity.
- Application of magnetism & electricity.
- Battery – Types of battery, Door bell, Generator, Electric motor etc.

Unit – 4 Instruments used in laboratory.

- Spectrometer, PH meter, colorimeter, centrifuge.
- Techniques of separation.
- Electrophoresis, chromatography.
- Radiation :- classification, properties and uses.
- Nano technologies: Introduction & uses.

Che – 104General chemistry (Core)

Objectives :

1) To provide basic understanding of chemicals their uses in day – to – day activities.
2) To impart basic knowledge of various types of chemicals, their preparation and properties, their nature of action use and importance in daily life.
3) To aware students regarding chemicals of day – to – day use.

Unit – 1

(A) Atomic structure

- Dalton's theory, Ratherhood's experiments, cathode tube experiments.
- Electron, proton, neutron, arrangement of electrons. (octane rule).
- Atomic number, mans number atomic weight, molecular weight and equivalent weight of simple chemicals.

(B) Chemical communication

- Symbol formula
- Valiancy
- Chemical equation, balancing of chemical equation.

Unit – 2

(A) Chemical bond

- Electrovalent and covalent bond
- Hydrogen bond
- Co-ordinate bond

(B) States of matter

- General characteristics of solid
- General characteristics of liquid.
- General characteristics of gases.

Unit – 3

(A) Solution.

- Types of solution
- Methods of expressing concentration of solution normality, morality, Formality, mole fraction percentage by weight and volume.
- Relation between solute to solvent, nature of solute and solvent.

(B) Gases

- General identification of gases on the basic of their properties.
- Identification of following gases.

  H_2, O_2, Co_2, NH_3, H_2O_2, CL_2, So_2 etc.

Unit – 4

(A) Electro chemistry

- Oxidation and reduction
- Electrolysis
- Application of electrolysis

(B) Acid and bases

- Properties of Acids
- Theories of acids and bases, Arcanum theory, Lewis acid, Lowry bronzed theory.
- Ph – general information, use of p^H and p^H paper.

Practical:

- Chemicals balance and its use knowledge of general apparatus used in chemistry laboratory.
- Titration of acid and base
  1. Weak acid and strong base.
  2. Strong acid and weak base.
  3. Strong acid and strong base.
- Qualitative analysis of inorganic compounds with one caption and one anion.

References:

1) 11^{th} and 12^{th} science Textbook by Gujarat Higher Secondary Board.
2) Organic Chemistry – Mounison and Boyed
3) Organic Chemistry – I. L. Finer Vol. I & II

I/c. Registrar
Hemchandracharya
North Gujarat University
PATAN

Soc – 105 Socio – Economics Analysis of Communities (Elective)

Objectives:

To enable the students to-

1. Understand the socio-economic structure and systems that make up the rural and urban communities.
2. Understand the meaning of social change through development plans and programs in the context of the existing-socio-economic structures and systems;
3. Recognize one's own role in the development process.

Unit -1

- Introduction to Social Structures and Systems – Framework for Analysis.

a. Meaning and Systems of Organization.

b. Relationship between Social Systems.

c. Types of Society – Harmonic – Disharmonic.

- Analysis of Family as a Social Unit.

  Type(s), average size (Micro/Macro), marriage patterns, district social roles and nature of relationships between members of the family; internal distraction in authority based on age and sex roles, gender differences with reference to activities and access to resource. Emerging patterns of familial organization influenced by broader economic and political forces – female headed household.

- Analysis of Social Relations of Groups Social Stratification – Caste System (Micro/Macro).

  Differential ranking of groups as superior and inferior caste-groups; changes that have taken place / expected; abolition of untouchability, inter-caste collaboration, fusion of sub-castes; impact of reservation; social inequalities – extent of acceptance or opposition.

Unit – 2 Analysis of Social Relations of Economic Life (Micro/Macro).

a. Resources available (land, water, climatic conditions, seeds etc.), type of technology in use (bullocks, ploughs – tractors, pump sets, means of transport), division of labour among the groups (unemployment, under employment).

b. Ownership pattern – land, livestock, ploughs, tractors, pump sets, transport etc., according to classes and gender.

c. Access to facilities of credit, irrigation, fertilizers, seeds, storage in relation to class groups and gender.

I/c. Registrar
Hemchandracharya
North Gujarat University
PATAN

d. Land cultivation pattern – family labor / tenancy or share cropping and consequent relation to different class groups to land; rent or wages paid-profit and loss in relation to the owner, tenant, laborer and gender.
e. Income distribution pattern, income disparities (growing or reducing) among class groups and within each class.
f. The type of economy – Subsistence or market surplus according to classes.
g. Market malpractices, access to market at different levels, to transport, to storage facilities.
h. Organizational strength of products, traders and consumers; dominant organizations that make market mechanisms work.
i. Consumption pattern of classes and in relation to gender – Quantity and quality of primary, secondary and tertiary goods – Relationship of consumption pattern to distribution pattern, production and market structures.
j. Class(es) that influence and control decisions.

Unit – 3 Poverty Analysis (Micro/Macro)

The number and proportion of poor (in general and with reference to gender in particular) prevalence to hunger and malnutrition, availability and accessibility to drinking water and sanitation facilities, health facilities, clothing and housing facilities, education facilities. Unemployment pattern and indebtedness; causes of poverty and inequalities; programs for poverty alleviation. Poverty line.

Social Relations in Religion and Culture (Micro / Macro).

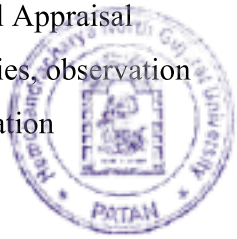
a. Religions represented – the role of religion in the lives of people.
b. Popular expression of beliefs and attitudes that promote fatalism or confidence in themselves.
c. Religious and cultural customs and organizational patterns that oppose the values of social justice, equality, liberty and solidarity.

Unit – 4 Analysis of Social Relation to Environment (Micro/Macro)

a. Customs, mores, rules, regulation that are not eco friendly.
b. Changing patterns of production and consumption – organic farming, soil and water conservation measures, recycling of water, use of bio-degradable articles etc., impact of these in the communities.

Approaches and Methods of Socio-Economic Analysis.

a. Rapid Rural Appraisal
b. Participatory Rural Appraisal
c. Surveys, case studies, observation
d. Participant observation



I/c. Registrar
Hemchandracharya
North Gujarat University
PATAN

M.V. (105) Moral and value education (Elective)

Unit – 1

Some life issues – Love, Sex and Marriage, Men and Money – Value of time,

Meaning of work, Human Communication, Human Suffering, Addiction, Ecology, Women's issues.

Understanding one's Neighbour. Neighbourhood groups: their structure and functions patterns of social interaction of group dynamics.

Unit – 2

Definition of Value Education, Moral and Ethics, Laws and Moral based on Ten Commandments and two great commandments.

Unit – 3

Discovery of Self, Self – Awareness Growth of Intellect – Man's Spiritual Nature

Emotions, Will. Respect the right of Life, Liberty, Property, Truth Reputation.

Sin, Orgin of Sin, Manifestation of sin, The result of Sin, The remedy of sin, sin as an act, Sin as a state, Sin as a nature.

Unit – 4

Conscience – as defined in Oxford Dictionary and Winston Dictionary, Types of Consciousness (such as Evil, Convicted, Purged, Pure, Weak, Good, Void of Offence).

I/c. Registrar
Hemchandracharya
North Gujarat University
PATAN

F.C. (106) (only practical) Food crafts (Elective)

Objectives:

1) To inoculate skills of fancy recipes.
2) To acquaint the students with the various terms used in cookery.
3) To develop the interest for varied cooking.

Practicals:

1) Cooking terms, methods of cooking.
2) Preparation of Appetizers.
3) Rice preparation.
4) Dough preparation.
5) Salad preparation and Dressing.
6) Desserts.
7) Preparation of Indian recipes.
8) Preparation of International recipes.

BC (106) Bakery and Confectionary (Elective)

Practical:

(1) Introduction:

(2) Preparation of bread

(3) Preparation of Biscuit

(4) Preparation of Cake

(5) Preparation of Pastry

I/c. Registrar
Hemchandracharya
North Gujarat University
PATAN

C.A. – 107 Computer Application (Foundation Elective)

Practical

1. Introduction to Computer.
2. M.S. Word
3. M.S. Excel
4. M.S. PowerPoint.
5. Internet.

I/c. Registrar
Hemchandracharya
North Gujarat University
PATAN

W.S.E. (107) (Practical)

Writing skill in English (Foundation Elective)

Practical

1) Basic grammar: Sentence making, Verb proverb
2) Translation, Sentence making.
3) Application Writing.
4) Letter, Story, Essay writing.
5) Verbal practices. / Spoken English.

I/c. Registrar
Hemchandracharya
North Gujarat University
PATAN

STATISTICS

I/c. Registrar
Hemchandracharya
North Gujarat University
PATAN

S101 :: Statistical Methods - I

Programme Name	Bachelor of Science
Semester	First
Paper No.	**S 101**
Course Name	**Statistical Methods - 1**
Course Type	Core
Effective From	June 2012

Unit No.	Content	Weitage	Credit
1	**Classification and Presentation of Data** 1. Concept of Statistical Population, Sample, Types of data: Discrete, continuous, frequency and non grouped, nominal, ordinal, interval, ratio, time series data and cross sectional data, primary, Secondary, internal and external data 2. Idea of a questionnaire, schedule, major sources including some government publication 3. Construction of frequency table (One and Two factors), diagrammatic and graphical representation of ungrouped and grouped data, histogram, frequency curve, ogives, stem and leaf plot, box-plots. **Measures of Central tendency**: 1. Concept of central tendency 2. Various measures of central tendency and their merits and demerits 3. Properties and applications of central tendency 4. Use of other partition values	25 %	0.75
2	**Probability** 1. Random process, random experiment, Trial, Sample point, Sample space, definitions of equally likely, mutually exclusive and exhaustive events, venn diagram 2. Definition of probability, classical and relative frequency approach to probability, axiomatic approach to probability and its properties.	25 %	0.75
3	**Economic Statistics** 1. Concept of demand and supply, formulation of demand and supply functions, Market Equilibrium, Determination of demand and supply curves from time Series data, 2. Elasticity of demand and supply and cost function, Revenue, Average revenue, Marginal Revenue and their relation with elasticity, 3. Optimization of revenue for a given demand law, Use of elasticity in classification of goods, problem of monopoly.	25 %	0.75
4	**Bivariate data and least square principle** 1. Concept of Bivariate data, plotting of Bivariate data, 2. Principle of least squares, fitting of linear, parabolic exponential (reducible to linear) curves 3. Scatter diagram, product moments, coefficient of correlation and its properties, coefficient of determination, rank correlation, 4. Concept of Regression, fitting of linear regression and related results	25 %	0.75

I/c. Registrar
Hemchandracharya
North Gujarat University
PATAN

Reference books

1. Moore, S. David; McCabe, P. George
Introduction to the Practice of Statistics, 4th Edition
W. H. Freeman and Company, New York.
2. Agarwal, B. L.
Basic Statistics
New age International (P) Ltd., 1995
3. Mood, A. M., Greybill, F.A., Boes, D.C.
Introduction to the theory of Statistics
McGraw Hill
4. Bhat, B.R. Srivenkatramana, T. And Raomadhav, K.S.
Statistics: A biginner's Text, Vol. I
New age International (P) Ltd., 1996
5. Burton, G. Carrol, G. And Wall, S.
Quantitative methods for Business and Economics
Lengman, New York, 1999.
Ch. 1,2.
6. Lindsey, J. K.
An introduction to appliled statistics – A modelling approach
2nd Ed. , 2003, Oxford University Press, ISBN – 978-0-19-852895-1
7. Cooke, Cramer and Clarke:
Basic Statistical Computing
Chapman and Hall
8. Morrison, D.F.
Applied Linear Statistical methods
Upper Saddle River, N.J.
Prentice Hall, 1983.
9. Dunn
Basic Statistics, A premier for the biomedical Sciences
2nd Ed., John Wiley and sons.
10. Hogg, R.V. and Craig, A.T.
In introduction to Mathematical Statistics
Amerind Publishing Co.
11. Tanur, J.M., Mosteller, F. Kruskal, W. H. Link, R.F., Pieters, R.S.,
Rising, G.R. (Special Editor: E. L. Lehman)
Statistics: A guide to the unknown.
Holden Day, San Francisco, 1989
12. Mendenhall, W.
Introduction to Probability and Statistics
9th Ed. North Scituate, Mass, Duxbury, 1994

I/c. Registrar
Hemchandracharya
North Gujarat University
PATAN

S102 :: Statistical Methods - I : Practical

Programme Name	Bachelor of Science
Semester	First
Paper No.	**S 102**
Course Name	**Statistical Methods – 1 : Practical**
Course Type	Core
Effective From	June 2012

Part	Content
A	**Manual Calculation** **1. Presentation of Data:** - Frequency Table (Univariate and Bivariate data) - Diagrams and Graphs: Stem and Leaf curve, Pie chart, Bar Chart, Histogram, frequency curve, frequency polygon, cumulative frequency curves (Ogives) - Interpretation of data **2. Measures of Central tendency:** - Arithmetic mean, Geometric mean, Harmonic mean, Weighted Arithmetic Mean, Combined Mean and combined variance. - Median, mode and other partition values. **3.** Fitting of linear and non linear curves reducible to linear form (two variable only) **4.** Karl Pearson's coefficient of correlation, Spearman's coefficient of rank correlation, **5.** Regression analysis: Lines of regression (linear case only) and other related problem. **6.** Fitting of demand curve from time series data, calculation of price elasticity of demand.
B	**Part B: Using Microsoft Excel** 1. Introduction to MS Excel – functions and statistical Data analysis 2. Classification, tabulations and frequency tables 3. Bar diagram, dot diagram, Histogram, frequency curves, ogives, Stem and leaf plots, Box plots 4. Summary statistics 5. Two way tables and plots 6. Product moments, Karl Pearson and Spearman's Correlations 7. Curve fitting: Method of least squares: linear, parabolic, exponential and polynomials (Up to three variables) 8. Regression lines 9. Fitting of demand curve from time series data, calculation of price elasticity of demand.

Duration: 2 Hours per week

I/c. Registrar
Hemchandracharya
North Gujarat University
PATAN

S103 :: Basic Probability Theory – I

Programme Name	Bachelor of Science
Semester	Second
Paper No.	**S 103**
Course Name	**Basic Probability Theory – I**
Course Type	Core
Effective From	December 2012

Unit No.	Content	Weitage	Credit
1	**Measures of Dispersion** 1. Concept of variation (dispersion), absolute and relative measures, their merits and demerits, applications of these measures, 2. Sample moments, skewness and kurtosis, measures based on skewness and kurtosis.	25 %	0.75
2	**Conditional probability** 1. Conditional probability, independence of events, pair wise and mutual independence, theorem on total probability, Bayes' theorem and its application 2. Applications of probability in various fields: marketing, gambling, finance, life testing experiments, actuarial science	25 %	0.75
3	**Time Series** 1. Idea of time series, components of time series 2. Measurement of trend by principle of least squares for mathematical curves (up to second degree) , moving average method, 3. Calculation of seasonal variation and seasonal indices by Ratio to moving average and ratio to trend method.	25 %	0.75
4	**Decision Analysis** 1. Idea of uncertainty 2. Decision under uncertainty, Principles (o criterions) for decision making – Laplace, Maximin, Minimax, Hurrwicz's 3. Decision under risk – Expected Monetary Value (EMV) Criteria, Expected Opportunity Loss (EOL), Expected value of Perfect Information (EVPI).	25 %	0.75

I/c. Registrar
Hemchandracharya
North Gujarat University
PATAN

Reference books

1. Feller, W.:
   An Introduction to probability theory and its application, Vol. I
   3rd ed. John Wiley and sons, New York, 1968.
2. Freund, J.E.:
   Introduction to Probability
   Encino Calif, Dickenson Publishing Co. Inc. 1973.
3. Parzen, E.
   Modern Probability theory and its applications
   John Wiley and sons Inc., New York, 1960
4. Lindsey, J.K.
   Introduction to Applied Statistics: A modelling approach
   2nd Ed. (2003)
   Oxford University Press
5. Lindley, D.V.
   Making Decisions
   2nd Ed. Wiley, London, 1985
6. Mandenhall, W. Introduction to Mathematical Statistics
   8th Ed. Duxbury, 1991
7. Mendenhall, W. Wackerly, D. and Scheaffer, R.L.
   Mathematical Statistics with applications
   4th Ed. PWS – Kent, 1990, Boston
8. Hogg, R.V. and Craig, A. T.
   Introduction to Mathematical Statistics
   Amerind Publishing Co.
9. Mood, A. M., Greybill, F.A., Boes, D. C.
   Introduction to the theory of Statistics
   McGraw Hill
10. Rohatgi, V. K.
    An Introduction to Probability theory and Statistics
    John Wiley and Sons, 1967
11. Mukhopadhyay, P.
    Mathematical Statistics
    New Central Book Agency. Kolcutta, 1996
12. Hoel, P.G.
    Introduction to Mathematical Statistics
    Asia Publishing House
13. Meyer, P. L.
    Introductory Probability and Statistical Applications
    Addison Wesley, 1970
14. Goon, A.M., Gupta, M.K. and Dasgupta, B.
    Fundamentals of Statistics, Vol. I., World press, Kolcutta,1991

I/c. Registrar
Hemchandracharya
North Gujarat University
PATAN

S104 :: Basic Probability Theory – I : Practical

Programme Name	Bachelor of Science
Semester	Seond
Paper No.	**S 104**
Course Name	**Basic Probability Theory – I : Practical**
Course Type	Core
Effective From	December 2012

Part	Content
A	**Manual Calculation** 1. Measurement of linear trend using least squares and method of moving average 2. Calculation of seasonal variation and seasonal indices by ratio to moving average 3. Calculation of seasonal variation and seasonal indices by ratio to trend method. 4. Solution of Decision problems using Maximin or Minimax, Maximaxor Minimin, Laplace and Horwiz Criterions (Principles) 5. Solution of decision problems under risk – by Expected Monetary Criterion (EMV), Expected Opportunity Loss (EOL), Expected Value of Perfect Information
B	**Using Microsoft Excel** 1. Measurement of linear trend using least squares and method of moving average 2. Calculation of seasonal variation and seasonal indices by ratio to moving average 3. Calculation of seasonal variation and seasonal indices by ratio to trend method. 4. Solution of Decision problems using Maximin or Minimax, Maximaxor Minimin, Laplace and Horwiz Criterions (Principles) 5. Solution of decision problems under risk – by Expected Monetary Criterion (EMV), Expected Opportunity Loss (EOL), Expected Value of Perfect Information **Note: 1. It is mandatory to have statistics laboratory, equipped with computers, MS office, Statcalc.** **2. Students are required to perform practical using Data analysis pack and functions of MS Excel as well as they are required to attach print outs of work done.** 3. The proposed batch size of statistics practical is 10 students per batch

Duration: 2 Hours per week

I/c. Registrar
Hemchandracharya
North Gujarat University
PATAN

GEOLOGY

I/c. Registrar
Hemchandracharya
North Gujarat University
PATAN

Hemchandracharya North Gujarat University, Patan

B.Sc. Programme (CBCS-Semester-Grading pattern)

Semester end Examination

Format for Question paper **Core Complementary Courses in Geology**

Time: 3Hrs **Total Marks: 70**

Part A

(Answer all **questions)**

1-06. Questions such as, MCQs, Fill in the blanks, Match the pairs, etc.

(Each of **1** Mark) [Covering All Units]

Part B

(Answer all **questions)**

07-11. Very short answer type questions such as, Definition, Explain the terms, etc

(Each of **2** Mark) [Covering All Units]

Part C

(Answer any eight**/ten of the following)**

12-17. Short answer type questions such as, Definition, Explain the terms, examples/problems, reasons, differences, figures/diagrams, etc. (Each of **2** Marks) [Covering All Units]

Part D

(Answer any four**/six of the following)**

18-23. Medium answer type questions such as, Short notes, figures/diagrams, examples/problems,

reasons, differences, etc. (Each of 3 Marks) [Covering All Units]

Part E

(Answer any three**/five of the following)**

24-27. Long answer type questions such as, Describe / Discuss in detail, diagrams, examples/ problems, etc. (Each of **6** Marks)) [Covering All Units]

Hemchandracharya North Gujarat University PATAN

I/c. Registrar
Hemchandracharya
North Gujarat University
PATAN

HEMCHANDRACHARYA NORTH GUJARAT UNIVERSITY, PATAN
CBCS - Semester - Grading Pattern
B.Sc. GEOLOGY Practical: SEMESTER-I
CC GEO-102 PR: Mineralogy Lab.
(in force from June 2016)

Study of the physical properties of the minerals

1. **Megascopic identification of the following common rock forming minerals:**
   Quartz, Amethyst, Chalcedony, Agate, Jasper, Orthoclase, Microcline, Plagioclase

2. **Megascopic identification of the following common rock forming minerals:**
   Muscovite, Biotite, Garnet, Hornblende, Augite, Tourmaline, Olivine, Chlorite.

3. **Megascopic identification of the following common rock forming minerals:**
   Magnetite, Hematite, Chromite, Pyrolusite, Pyrite, Galena, Sphalerite, Bauxite.

4. **Determination of specific gravity of minerals** – by Walker Steel Yard Balance and Jolly's spring Balance.

I/c. Registrar
Hemchandracharya
North Gujarat University
PATAN

HEMCHANDRACHARYA

NORTH GUJARAT UNIVERSITY

F. Y. B. Sc.

Semester I

GEOLOGY - THEORY and PRACTICALS

Course-wise detail syllabus

GEO 101: General and Physical Geology, Mineralogy

Unit Course details

Unit –1 **EARTH AS A PLANET:** General principles of geology as a science. Branches & scope of subject. Earth as a member of solar system – shape, size, mass and density of the earth – its movements. Origin of the earth – review of the different theories. Origin of the universe and evolution of the solar system.

Unit –2 **EARTH'S INTERNAL STRUCTURE:** Earth's internal structure, constitution, composition and formation. Brief introduction to Radioactivity and age of the Earth. Introduction to Convection in the earth's interior and earth's magnetic field. Elementary ideas of continental drift and plate tectonics.

Unit - 3 **PHYSICAL GEOLOGY:** Weathering, erosion, denudation, transportation and deposition. Introduction to Geological agents – Glaciers, Rivers, Lakes, Winds.

Unit - 4 **MINERALOGY:** Chemical bonding and compound formation. Definition, Classifications and Physical properties of minerals.

Reference Books:

1) Introduction to Physical Geology, A. K. Datta, Kalyani Publisher, New Delhi.
2) A Text Book of Geology, P. K. Mukerjee, World press.
3) A Text Book of Geology with Special Reference to India, G. B. Mahapatra.
4) General Geology, V. Radhakrishnan (1987), V.V.P. Publishers, Tuticorin.
5) Geomorphology, Enayat Ahmed, Kalyani Publisher, New Delhi.
6) Principles of Geomorphology, W. D. Thornbury (1969), John Willey Inc.
7) Principles Physical Geology, Arthur Holmes (1978), ELBS.
8) Engineering and General Geology, Parbin Singh (1994), S.K. Kataria and Sons, Delhi.
9) Rutley's Elements of Mineralogy, H. H. Read, CBS publishers.
10) Introduction to Rock Forming Minerals, R. A. Deer, R. E. Howie and J. Zussman (1978), The English Language Book Society.

HEMCHANDRACHARYA NORTH
GUJARAT UNIVERSITY, University Road,
P.O. BOX NO: 21, PATAN-384265.

N. Gujarat,INDIA.

NAAC Accreditation

Grade–"A"

FACULTY OF

SCIENCE

GEOLOGY

SYLLABUS

(Effective from June-2018)

B.Sc. (Semester IProgramme)

The proposed new courses in Geology for undergraduate classes are reassigned in accordance to semester / CBCS / Grading system with new education policy. The new course is based on model curriculum of the university grants commission.

The medium of instruction should be Gujarati / English and the question paper should be drawn in Gujarati / English version. Students are permitted to write answer in English or Gujarati language.

Its objectives are as under:

1. To meet the growing demand of Specialization and Advanced Courses in applied science.
2. To help the colleges to update and modernize their laboratories.
3. To redesign the courses the special emphasis on local requirements, environment, to link the courses with requirements of the industries and research.
4. To prepare for National level entrance test like NET / SLET / JRF and other competitive exams.

I/c. Registrar
Hemchandracharya
North Gujarat University
PATAN

HEMCHANDRACHARYA NORTH GUJARAT UNIVERSITY,UniversityRoad, P.O. BOX NO: 21, PATAN-384265.

N. Gujarat,INDIA.

NAAC Accreditation

Grade–"A"

FACULTY OF SCIENCE

GEOLOGY

SYLLABUS

(Effective from June-2018)

Common Formula for Question Paper (Core Course)

Time: 3 Hours Total Marks: 70

Theory Examination Pattern (Core Course):

Que. No: 1	A: Write any Two out of Three Questions.	**14 Marks**
	B: Write any one out of Two Questions.	**06 Marks**
Que. No: 2	A: Write any Two out of Three Questions.	**14 Marks**
	B: Write any one out of Two Questions.	**06 Marks**
Que. No: 3	A: Write any Two out of Three Questions.	**14 Marks**
	B: Write any one out of Two Questions.	**06 Marks**
Que. No: 4	Write any Ten out of Twelve Short questions / M.C.Q / Short numerical / diagram (Three Questions to be asked from each Unit).	**10 Marks**

Hemchandracharya North Gujarat University PATAN

I/c. Registrar
Hemchandracharya
North Gujarat University
PATAN

HEMCHANDRACHARYA NORTH GUJARAT UNIVERSITY,University Road, P.O. BOX NO: 21, PATAN-384265.

N. Gujarat,INDIA.

NAAC Accreditation

Grade–"A"

FACULTY OF SCIENCE

GEOLOGY

SYLLABUS

(Effective from June-2018)

Common Formula for Question Paper (Elective Course)

Time: 2 Hours

Total Marks: 50

TheoryExaminationPattern (Elective Course):

Que. No: 1	A: Write any two out of Three Questions. (Each of 05 marks)	**10 Marks**
Que. No: 2	A: Write any two out of Three Questions. (Each of 05 marks)	**10 Marks**
Que. No: 3	A: Write any two out of Three Questions. (Each of 05 marks)	**10 Marks**
Que. No: 4	A: Write any two out of Three Questions. (Each of 05 marks)	**10 Marks**
Que. No: 5	Write any Ten out of Twelve Short question / M.C.Q / Short numerical / diagram (Three Questions to be asked from each Unit).	**10 Marks**

I/c. Registrar
Hemchandracharya
North Gujarat University
PATAN

HEMCHANDRACHARYA NORTH GUJARAT UNIVERSITY,University Road, P.O. BOX NO: 21, PATAN-384265.

GEOLOGY

PRACTICAL

(Effective from June-2018)
GEO 101 PR-1

Common Formula for Question Paper (Practical Course)

Time: 05 Hour **Total Marks: 50**

Practical Examination Pattern:

1. Identify the Megascopic Minerals. Give physical properties of it and give name of the Minerals.
2. Identify the Megascopic Minerals. Give physical properties of it and give name of the Minerals.
3. Determine the specific gravity of minerals by using walker steel Yard and Jolly's spring Balance.
4. Viva-voce.
5. Journal Work.

I/c. Registrar
Hemchandracharya
North Gujarat University
PATAN

Design and Structure of Geology (Earth Sciences) UG Courses for Choice Based Credit System to be implemented from June 2018

HEMCHANDRACHARYA NORTH GUJARAT UNIVERSITY, PATAN						
B. Sc. Three year (General) Programme with 144 credits Semester -III and IV in **GEOLOGY** from June-2018						
General pattern/scheme of study components along with credits						
Study Components		**Instru. Hrs/ Week**	**Examination**			**Credits**
			Internal Marks	**UNi. Exam. Marks**	**Total Marks**	
Semester – I						
	Core Compulsory (CC) Course					
GEO 101	General and Physical Geology, Mineralogy	4	30	70	100	4
CC-II-1	Core Course	4	30	70	100	4
CC-III-1	Core Course	4	30	70	100	4
	Practical core (PC) Course					
GEO 101 PR-1	Mineralogy Lab.	4		50	50	2
PC-II-1	Practical Core Course	4		50	50	2
PC-III-1	Practical Core Course	4		50	50	2
	Foundation Course (FC)					
FG	Compulsory English (L.L.)	2	15	35	50	2
	Elective Course (EC)					
EG	Elective (Generic) Course	2		50	50	2
GEO (CSE)	Elective (Geology) Course - Historical Geology	2		50	50	2
		30	**105**	**495**	**600**	**24**

I/c. Registrar
Hemchandracharya
North Gujarat University
PATAN

F. Y. B.Sc.

Semester I

GEOLOGY - THEORY and PRACTICALS

Course-wise detail syllabus

GEO 101: General and Physical Geology, Mineralogy

Unit	Course details
Unit –1	EARTH AS A PLANET: General principles of geology as a science. Branches & scope of subject. Earth as a member of solar system – shape, size, mass and density of the earth – its movements. Origin of the earth – review of the different theories. Origin of the universe and evolution of the solar system.
Unit –2	EARTH'S INTERNAL STRUCTURE: Earth's internal structure, constitution, composition and formation. Brief introduction to Radioactivity and age of the Earth. Introduction to Convection in the earth's interior and earth's magnetic field. Elementary ideas of continental drift and plate tectonics.
Unit - 3	PHYSICAL GEOLOGY: Weathering, erosion, denudation, transportation and deposition. Introduction to Geological agents – Glaciers, Rivers, Lakes, Winds.
Unit – 4	MINERALOGY: Chemical bonding and compound formation. Definition, Classifications and Physical properties of minerals.

Reference Books:

1) Introduction to Physical Geology, A. K. Datta, Kalyani Publisher, New Delhi.
2) A Text Book of Geology, P. K. Mukerjee, World press.
3) A Text Book of Geology with Special Reference to India, G. B. Mahapatra.
4) General Geology, V. Radhakrishnan (1987), V.V.P. Publishers, Tuticorin.
5) Geomorphology, Enayat Ahmed, Kalyani Publisher, New Delhi.
6) Principles of Geomorphology, W. D.Thornbury (1969), John Willey Inc.
7) Principles Physical Geology, Arthur Holmes (1978), ELBS.
8) Engineering and General Geology, Parbin Singh (1994), S.K. Kataria and Sons, Delhi.
9) Rutley's Elements of Mineralogy, H. H. Read, CBS publishers.
10) Introduction to Rock Forming Minerals, R. A. Deer, R. E. Howie and J. Zussman (1978), The English Language B ook Society.

GEO 102 (CSE): Historical Geology

Unit	Course details	Credits
Unit–1	Historical geology-Concept, Earth's Age, Understanding of origin and evolution of life.	**1**
Unit–2	Concepts of geological time and Geologic Time Scale. Major events of mass extinction.	**1**

GEO 101 PR-1: Mineralogy Lab.

Course details
Study of the physical properties of the minerals – Megascopic identification of the following common rock forming minerals: Quartz, amethyst, chalcedony, agate, jasper, orthoclase, microcline, plagioclase, muscovite, biotite, garnet, hornblende, augite, tourmaline, olivine, chlorite. Ores – magnetite, hematite, chromite, pyrolusite, pyrite, galena, sphalerite, bauxite. Determination of specific gravity of minerals – by Walker Steel Yard Balance and Jolly's spring Balance.

Hemchandracharya North Gujarat University PATAN

I/c. Registrar
Hemchandracharya
North Gujarat University
PATAN