MATHEMATICS

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North Gujarat University
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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.

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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.

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(ii) One Peon for computer laboratory.

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Mathematics : Semester-2
Course : CC MAT-122

UNIT-1. De'Morve's theorem and its applications, (a) Roots of a complex number

(b) Application of Expansion of $\sin^n\theta, \cos^n\theta$, n N in terms of sine and cosine of multiples of θ.

(C) Expansion of sinnθ, cosnθ and tannθ in terms of sine, cosine and tangent resply.

UNIT -2. (a) Exponential, Circular and hyperbolic function, Logarithmic and inverse functions.

(b) Sequence and series: Definition of sequence, series. Definition of convergence of sequence and series, partial sum, comparison test, ratio test, root test and its examples.

UNIT -3. (a) Linear differential equation dy/dx + Py = Q, P and Q are functions of x, Bernoulli's differential equation. (b)Differential equation of first order and higher degree solvable for s, solvable for y, solvable for P= dy/dx.(c)Solution of Clairaut's and Lagrange's differential equation. (d) Linear differential equation with constant coefficients.

UNIT -4. Matrices:Introduction of matrices, different types of matrices, operations on matrices, theorems on matrices, Symmetric and skew -symmetric matrices, Hermitian and skew-Hermitian matrices, linear dependence and independence of row and column matrices. Row rank, Column rank and rank of matrix, Row reduced Echelon form of a matrix and matrix inversion using it.

Reference Books:

(1) Complex Variables and Appiication, by Ruel V. Churchill & James Ward Brown, McGraw-Hill Publishing Company, New Delhi.

(2) Complex Analysis, by J.V.DESHPANDE, Tata McGRAW-Hill Publishing Co. Ltd. New Delhi.

(3) Theory of Matrices, by B.S.Vatssa, 2nd Edition, Wiley Easterns Ltd.

(4) Matrix Operations, by Schaum's Series McGRAW-HILL Book Co.

Course : PC MAT-122

List of Practicals:

Unit:1(1) Application of De'Morve's theorem.

(2) Application of roots of complex number.

(3) Application of $\text{Sin}^n\theta$ and $\text{Cos}^n\theta$ in terms of series of sine and cosine respectively.

(4) Application of sinnθ and cosnθ in terms of series of sine and cosine.

(5) Application of tannθ in terms of series of tangent.

Unit:2(1) Application of Exponential, Circular and hyperbolic function

(2) Application of inverse hyperbolic function and logarithm function of a complex number.

(3) Application of comparison test for a given sequence.

(4)Application of root test for a given sequence.

(5) Application of ratio test for a given sequence.

Unit:3(1) Application of linear differential equation dy/dx + Py = Q, where P and Q are function of x.

(2) Application of Bernoully's differential equation.

(3) Application of differential equation in first order and higher degree solvable for x, y and p, where p= dy/dx.

(4) Application of clairant's differential equation

(5) Application of linear differential equation with constant coefficients.

Unit:4(1)Solution of simultaneous linear equations using matrices.

(2)Application of the inverse matrix by row reduction method.

(3)Application of the rank of a matrix.

(4)Application of the rank of a matrix by transforming into echelon form.
(5) Application of Hermitian and skew-Hermitian matrices.
(6) Matrix operation through Excel.(Addition, Multiplication, Inverse, Determinant, etc…..)

Course :PC MAT-122

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

1. Attempt any two out of three from 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 :ESMAT-12 -Industrial Mathematics- 1

Unit : I

- Introduction to game theory
- Two-person zero sum theory
- Pure strategies' (Minmax and maxmin principles)
- Mix strategies
- Game with saddle point
- Rules to determine saddle point
- Game without saddle point
- Dominance principles solution of n á 2 and 2 á n game graphically

Unit : II

- Introduction to replacement problem
- Type of failure
- Replacement of items whose efficiency deteriorates with time
- Replacement of items that completely fail

Reference Books:

1. Operations Research,Theory & ApplicationJ.K.Sharma,4th Ed Macmillan Pub.
2. Operations Research,
2. Kanti swarup, Gupta P.K. , Manmohan Sultan Chand & Sons,New Delhi
3. Operations Research ;PHI , Shah,Gor,Soni

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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**

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CBCS - Semester - Grading Pattern
B. Sc. :: BOTANY :: SEMESTER-II
CC BOT-122
(in force from June 2011)

Unit-I : Genetics

- Genetics: Introduction to genetics, Mendel's work and its results
- Mendel's Experiments: Monohybridisation and its experiment, Monohybrid ratio (3:1, 1:2:1)
  - Law of Dominance and Law of Segregation
  - Dihybridisation and its experiment, Dihybrid ratio (9:3:3:1)
  - Law of independent Assortment
  - Back cross and Test cross
- Gene Interactions:
  - (A) Incomplete Dominance and Co-dominance
  - (B) Epistasis:
    - Dominance Epistasis ratio (12:3:1),
    - Recessive Epistasis ratio (9:3:4),
    - Double recessive Epistasis ratio (9:7) and
    - Double dominance Epistasis ratio (15:1)

Unit-II : Biology of Cryptogams (Bryophytes & Pteridophytes)

- Silent futures of Bryophytes
- Life history of *Marchantia* with reference to:
  - Systematic position (Rothmaler and Proskaur) with reasons, Habit and Habitat, External and Internal structure of vegetative and reproductive organs, Fertilization, External and Internal structure of mature Sporophyte, Germination of Spores
- Silent futures of Pteridophytes
- Life history of *Nephrolepis* with reference to:
  - Systematic position (Smith) with reasons, Habit and Habitat, External structure of vegetative organs, External and Internal structure of fertile (reproductive) leaflet, Structure of mature Gametophyte along with sex organs and Fertilization.

Unit-III : Angiosperm Morphology (External)

- **Leaf**:
  - Phyllotaxy,
  - Stipules: Types and Modifications,
  - Venation,
  - Incision,
  - Simple and Compound leaves

Unit-IV : Plants and Human welfare

- Classification of Economic important plants (on the basis of uses)
- To study the following Economic important plant specimens with reference to its Botanical name, local name, family, useful part(s), Botanical characters, important chemical constituents and uses:

  Cereals: Wheat and Maize;
  Pulses: Pea and Cajan pea;
  Nuts: Cashewnut and Almond;
  Vegetables: Carrot and Potato;
  Fruits: Banana and Mango;
  Spices: Ginger and Clove;
  Beverages: Tea and Coffee;
  Sugar-yielding Plants: Sugar cane & Sugar beet.

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B. Sc. :: BOTANY Practical :: SEMESTER-II
PC BOT-122 (in force from June 2011)

Unit-I : Genetics

- To study through Examples:
  (A) Mendel's Experiments: Monohybrid ratio (3:1/1:2:1), Dihybrid ratio (9:3:3:1)
  Back cross and Test cross
  (B) Epistasis:
  - Dominance Epistasis ratio (12:3:1),
  - Recessive Epistasis ratio (9:3:4),
  - Double recessive Epistasis ratio (9:7) and
  - Double dominance Epistasis ratio (15:1)

Unit-II : Biology of Cryptogams (Bryophytes & Pteridophytes)

- To study the Life history of *Marchantia* through:
  - Specimen - Vegetative Thallus and thallus with Gemma cup
  - Mountings - Thallus and Reproductive organs
  - Permanent Slides - Thallus, Gemma cup, Antheridia, Archegonia, Sporophyte
- To study the Life history of *Nephrolepis* through:
  - Specimen - Sporophytic plant (with Vegetative and Fertile leaflets)
  - Mountings - Hydathode, T.S. of leaflet passing through sori, Sporangia, Spores
  - Permanent Slides - T.S. of leaflet passing through sori, Prothallus: young & mature with Antheridia, Archegonia and Sporophyte

Unit-III : Angiosperm Morphology (External)

- To study the morphological plant specimens of **Leaf** through common examples:
  - **Phyllotaxy**: Alternate: Distichous - *Polyalthia*; Tristichous - *Cyperus*; Pentastichous - Shoeflower, Opposite: Superposed - *Quisqualis*; Decussate - *Calotropis*; Verticillate (Whorled) : *Nerium / Alstonia*
  - **Stipules**: Free lateral - Shoeflower; Adnate - *Rosa*; Interpetiolar - *Ixora*; Intrapetiolar – *Gardenia*; Ochreate - *Polygonum*; Foliaceous - *Pisum*; Spinous – *Zizyphus*, *Acacia*; Tendillar - *Smilax*; Convolute (scaly) - *Ficus*
  - **Venation**: Reticulate: Pinnate (Unicostate) - *Ficus*; Palmate (Multicostate) convergent - *Zizyphus*; Palmate (Multicostate) divergent - *Ricinus*
    Parallel: Pinnate (Unicostate) - *Canna*; Palmate (Multicostate) convergent - Maize; Palmate (Multicostate) divergent - Fan palm
  - **Incision**: Pinnatifid - Chrysanthemum; Pinnatipartite - *Argemone*; Pinnatisect - Marigold
    Palmatifid - Cotton; Palmatipartite - *Ricinus*; Palmatisect - *Ipomoea palmate*
  - **Simple leaf**: Shoe flower
    Compound leaves: Pinnate: Unipinnate - Paripinnate - *Cassia*; Imparipinnate - *Rosa*; Bipinnate - *Caesalpinia*; Tripinnate - *Moringa*; Decompound - *Coriander*, Palmate: Unifolioate - *Citrus*; Bifoliate - *Balanites*; Trifoliate - *Aegle*; Multifoliate (Digitate) - *Bombax*.

Unit-IV : Plants and Human welfare

- To study the following Economic important plant specimens / organ / product (fresh / preserved) with reference to its Botanical name, local name, family, useful part(s), Botanical characters, important chemical constituents and uses:
  - Cereals: Wheat and Maize;
  - Nuts: Cashewnut and Almond;
  - Fruits: Banana and Mango;
  - Beverages: Tea and Coffee;
  - Pulses: Pea and Cajan pea;
  - Vegetables: Carrot and Potato;
  - Spices: Ginger and Clove;
  - Sugar-yielding Plants: Sugar cane and Sugar beet

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CBCS - Semester - Grading Pattern
B. Sc. :: BOTANY Practical :: SEMESTER-II
PC BOT-122
(in force from June 2011)

Guideline for arrangement of specimens

1. Que. 1. **a** and **b**: Solve the Genetical problems as per theory syllabus and given slips.
2. Specimen **A**: *Marchantia / Nephrolepis*
3. Specimen **B**: *Marchantia / Nephrolepis*
4. Specimen **C** and **D:**
    i. **Cereals**: Wheat and Maize;
    ii. **Pulses**: Pea and Cajan pea;
    iii. **Nuts**: Cashewnut and Almond;
    iv. **Vegetables**: Carrot and Potato;
    v. **Fruits**: Banana and Mango;
    vi. **Spices**: Ginger and Clove;
    vii. **Beverages**: Tea and Coffee;
    viii. **Sugar-yielding Plants**: Sugar cane and Sugar beet
5. Identify and describe the peculiarities/structure observed in given specimens:
    a: Phyllotaxy
    b: Stipules
    c: Venation
    d: Incision
    e: Simple and compound leaves

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CBCS - Semester - Grading Pattern
B. Sc. :: BOTANY Practical :: SEMESTER-II
PC BOT-122
(in force from June 2011)

Date: Place:

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

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

1. **a**. Solve the given Genetical problem (as per given slip). **04**

   b. Solve the given Genetical problem (as per given slip). **06**

2. Identify and describe structural peculiarities observed in the given plant specimen **A.** **06**

3. Make a temporary preparation (slide) 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. **06**

4. Give Botanical name, local name, family, botanical characters, useful part(s), chemical constituent(s) and uses of given economic important plant specimens **C** and **D**. **10**

5. Identify and describe the external morphology observed in given specimens: **10**

   a: Phyllotaxy (as per theory syllabus)

   b: Stipules (as per theory syllabus)

   c: Venation (as per theory syllabus)

   d: Incision (as per theory syllabus)

   e: Simple and compound leaves (as per theory syllabus)

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

   b. Journal **04**

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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	

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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	

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MICRO-BIOLOGY

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SEMESTER – II

MB – 02 FUNDAMENTALS OF BACTERIOLOGY 4 Credits (60 Hours)

Unit : I Prokaryotic Cell Organization (15 Hours)

1.1 Shape, size and arrangement of bacterial cell

1.2 Structure of bacterial cell :

1.1.1 Surface appendages of bacteria : General nature, arrangement, structure and role of flagella, Gneral nature and significance of pili, prosthecae and stalks

1.1.2 Surface layers of bacteria : General nature and significance of capsule and slime layer, cell wall, cell membrane and Mesosomes

1.1.3 Bacterial cytoplasm and cell organelles : Cytoplasm, cytoplasmic inclusions, nuclear material

1.3 Bacterial endospore : Spore structure, sporulation and spore germination

Unit : 2 Introduction to Bacterial Nutrition & Growth (15 Hours)

2.1 Nutritional diversities in bacteria

2.2 Nutritional requirements of bacteria

2.3 Composition and nutritional value of ingredients of growth media

2.4 Cultivation methods of bacteria, characteristics of growth, modes of cell division

Unit : 3 Principles of Microbial Control (15 Hours)

3.1 General principles : Control by killing, inhibition and removal

3.2 Physical agents of microbial control : Osmotic Pressure, Filtration(HEPA filters)

3.3 Chemical agents of microbial control : Ideal antimicrobial chemical agent, Major groups of antimicrobial agents : Phenolics, Phenol coefficient, Halogens, Surfactants, Alcohols, Dyes, Heavy metals and gaseous agents, antibiotics

Unit : 4 Introduction to Bacterial Taxonomy and Nomenclature (15 Hours)

4.1 Basic principles of Bacterial Taxonomy & Nomenclature

4.2 Introduction to different systems of bacterial classification, modern systems

4.3 Introduction to Bergey's Manual of Systematic Bacteriology

LAB – 2: (B. Sc. Sem. – II)

1. Cultivation of different groups of bacteria
2. Study of pigmented bacteria : *S. aureus, S. epidermidis, M. luteus, S. marscecens, P. aeruginosa*
3. Study of bacterial structure by structural staining : Spore, Capsule, Cell Wall
4. Special staining : Spirochete by Fontana's method
5. Growth Curve of *E. coli*
6. Effect of temperature and pH on growth of bacteria
7. Study of effect (Bacteriostatic & Bactericidal) of chemicals on bacterial growth : heavy metals, phenol, mercuric chloride, crystal violet, antibiotics by different methods : strip method, agar ditch method, agar cup method.
8. Morphological and biochemical characteristics of selected bacterial genera : *Escherichia, Bacillus, Pseudomonas, etc.*

References :

Stanier, R.Y., Adelberg, E.A. and J.I. Ingram. (1991). "General Microbiology", 5th Edition, Printice Hall of India Pvt. Ltd., New Delhi.

Pelczar, M.J., Chan, E.C.S. and N.R. Kreig (1993). "Microbiology" 5th Edition, Tata Mc Graw Hill Publishing co. Ltd., New Delhi.

A.S. Rao (1997). " Introduction to Microbiology". Printice-Hall of India Pvt. Ltd., New Delhi.

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Presscott, M. J., Harley, J.P. and D.A. Klein (2002). "Microbiology", 5th Edition, WCB Mc GrawHill, New York.

Tortora, G.J., Funke, B. R. and C. L. Case (2004). " Microbiology : An Introduction", Pearson Education, Singapore.

Black, J. G. (2005). "Microbiology : Principles and Explorations". John Wiley, U.S.A.

Frobisher, H., Hinsdil, R.D., Crabtree, K. T. and D. R. Goodhert (2005). " Fundamentals of Microbiology", Saunder & Co., London.

J.G. Black. (2005). " Microbiology : Principles and Explorations"John Willey, USA.

Singh, R.P. (2007). "General Microbiology". Kalyani Publishers, New Delhi.

Gopal Reddy, M., M. N. Reddy, DVR Saigopal and K.V. Mallaiah (2007). " Laboratory Experiments in Microbiology. Himalaya Publishing House, Mumbai.

Reddy, S.M. and S. R. Reddy (1998). Microbiology – Practical Manual, 3rd edition, Sri Padmavathi Publications. Hydearabad.

Cappuccino, J. G. and N. Sherman. (2005). Microbiology – A Laboratory Manual. 7th Edition, Pearson Education. Published by Dorling Kindersley (India) Pvt. Ltd.

Alcamo, I.E. (2001). Laboratory Fundamentals of Microbiology. Jopnes and Barlett Publishers, USA.

ZOOLOGY

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SEMESTER-II

Core Course: CC-Zoo 122: Invertebrate Zoology: II

Unit-I Taxonomy **15 hours**

- Classification of following Phyla up to Class
  Annelida, Arthropoda, Mollusca
  Echinodermata, Hemichordata

Unit-II Type Study -2 **15 hours**

- Earthworm: Ext. Feature; Body wall; Digestive system; Nervous system; Reproduction system; Circulatory system; excretory system
- Pila: Ext. Features; Digestive system; Nervous system

Unit-III Human Physiology **15 hours**

- **Blood**
  - Composition of Blood and tonicity of RBC
  - Blood coagulation
  - Blood related diseases: Thalassemia; Haemophilia; AIDS and Anaemia
- **Reproduction**
  - Gametogenesis, Ovulation, Menstrual cycle, and Fertilization

Unit-IV Ecology and Wild Life Biology **15 hours**

- **Ecology**: Definition; Structure and functions of Ecosystems; Types of Ecosystem[Terrestrial(Desert & Forest) and Aquatic(Fresh water only)]
- **Wild Life**: - National Park[Gir; Velavadar; Marine & Vansada] and Sanctuaries
- [Jassore; Wild Ass; Nal sarovar; Shulpaneshwar] of Gujarat; Asiatic Lion project; Endangered wild life fauna of Gujarat and threats

Reference Books:

1. Modern Textbook of Zoology INVERTEBRATES, R.L.Kotpal, Rastogi publication
2. INVERTEBRATE ZOOLOGY, P.S.Dhami & P.S. Dhami
3. Text book of Invertebrates, N Arumugam, Saras Publication
4. Non-chordata, E.L.Jordan and P.S.Varma, S.Chand & Co.
5. , ... , . .ણ બાડ
6. , ... , . .ણ બાડ
7. Animal Physiology, Goel and Shashtri,
8. Human Physiology, Chatterji & Chatterji
9. Animal Physiology, N. Arumugam, Saras Publicaiton
10. Text book of Medical Physiology, Arthur C. Guyton, W.B.Saunders company
11. Odum, E P, Fundamentals of Ecology
12. Soni V.C., Vanya Jeev ane Teni Vyavastha, Guj. Granth Nirman Board
13. Sharma, P.D. Ecology and Environment
14. Singh, H.S. Natural Heritage of Gujarat

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Core Course: PC-Zoo 122: Practical Zoology II
(PRACTICAL for SEMESTER-II)

A. Classification of following specimens up to class
1 Annilida: Neries , Arenicola, Leech
2 Arthropoda: Peripatus, Crab, Centipede, Butterfly, Scorpion
3 Mollusca: Chiton, Pila, Unio, Octopus
4 Echinodermata:Starfish, Brittlestar, Seaurchin, sea cucumber, Sealily
5 Hemichordata: Balanoglosus

B. Dissection of Earthworm:
6. External Character
7. Digestive system
8. Nervous system
9. Reproductive system
10. Mountings: Setae, Blood glands, Septal nephridia, Spermatheca

C. Study of Permanent slides:
11. Pila: Redula
12. Earthworm: - T.S. Passing thro Pharynx
    - T.S. Passing thro Gizzard
    - T.S. Passing thru Typhlosole
    - W.M. of Ovary
13. Blood: Blood Smear
14. Reproduction: P.S. of Mammalian Testis and Ovary
15. Ecology and Wild Life (through chart or models or Field Study)
16. Visit to various places to study different Ecosystem and Submit the excursion report).
17. Study of any one National park (through chart)
18. Study of Sanctuaries (through chart)
19. To prepare a list of endangered fauna with their details
20. To make survey of Blood related diseases in your town:
    Anemia/Hemophilia/Thelassemia/AIDS

List of Elective Courses: (EC Zoo…)

- Animal health science
- Human diseases and control
- Animal diversity
- Zoo maintenance and museum curation
- Pest control Technology
- Dairy science and technology
- Forensic science
- Inland fisheries
- Sociality in animals

EC- Zoo___
Animal Health Science

Unit 1: General Introduction

- **Differentiation about Pets, Farm animals, Live stock and Wildlife and their health related issues**
- **Common Health Problems in farm animals and pets**

  causes of ill health, injury, pains, conditions, nutritional problems; living organisms; parasites; family pets common conditions; dogs; cats; caged birds; aquarium fish; mice; wild animals common conditions; reptiles.
- **Health Problems in Domestic Pets**

  Burns; urinary tract infections; shock; electrolytes, ticks; reptiles; fish problems.

Unit 2: Health indicators and their assessment

- **Signs of Illness**

  vital signs, the healthy animal; signs & symptoms of diseases; recognising ill health; diagnosis of diseases; taking smears, taking tissue samples; diagnosis and control of different types of diseases including viruses; bacteria; protozoa; parasites; mites; fleas.
- **Preventative Health Care**

  Diet; insect control; dip; vaccinate; avoid stressing livestock; vaccination.
- **Rehabilitation Care**

  Animal nursing, planning and recovery

EC-Zoo__

Human Diseases and Control

Unit 1: General Introduction

- Types of diseases: communicable and non communicable Disease
- Disease vectors and their mode of transmission
- Important disease vectors
- Epidemic disease

Unit 2: Prevention and Control

- Biological control of Vectors
- Prevention of Communicable diseases
- Prevention and control of genetic diseases
- Role of government in controlling diseases

EC-Zoo__

Pest Control Technology

Unit 1: Introduction to Animal Pests

- Pests, their classification and significance of their control
- Insect pests: Identification, General Information and Type of Damage
- Avian Pests: Identification, General Information and Type of Damage
- Mammalian Pests: Identification, General Information and Type of Damage

Unit 2: Pest Control

- Introduction of pest control
- Control of Insect pests
- Controlling Avian pests
- Control of Mammalian Pests

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F.Y.B.Sc.

Chemistry. (CC CH 201)

Semester: II

Unit : 1 (A) COORDINATION COMPOUNDS

- Definition
- Nomenclature of Complex.
- Werner's theory and its experimental verification.
- Concept of Effective Atomic Numbers (E.A.N.) for Coordination Compounds.
- Limitations of Valence bond theory of transition metal Complexes.
- An Elementary idea of (C.F.T.) Crystal field splitting of d-orbital in Oh and Td.
- Factors affecting to the crystal field splitting.
- Application of common complexes & chelates.

(B) ACTINIDE.

- Electronic Configuration.
- Oxidation state.
- Synthesis of $^{239}_{94}Pu$, $^{241}_{94}Pu$.

Unit : 2 STEREO CHEMISTRY OF ORGANIC COMPOUNDS

Introduction of Stereo Isomers;

- Optical isomerism :

  General, Discussion of elements of symmetry, Molecular chirality, Enantiomers, Optical activity, Properties of enantiomers, Chiral and achiral molecules with two stereogenic centers, Diastereomers, Threo and Erythro diastereomers, Meso compounds.

- Geometrical isomerism:

  Definition and general discussion of geometric isomers, General methods of structure determination (physical methods), E-Z nomenclature (Simple illustration should be given).

- Conformational isomerism:

  Definition, Conformational analysis of ethane, n-butane with rotational and tortional diagram, Conformation of cyclo hexane, Axial and equitorial bonds, Newmann projection, Show horse formula, Fisher & flying wedge formula, Difference between conformation and configuration.

Unit : 3 (A) CHEMICAL KINETICS.

- Introduction of following terms.
- Rate of reaction, Order of reaction, Molecularity.
- Rate equation for second order reaction. (a=b) & (a≠b).
- Characteristics of second order reaction.
- Rate equation for third order reaction.
- Characteristics of third order reaction.
- Numerical.

(B) NUCLEAR CHEMISTRY.

- Concept of Nuclear particle.
- Definition of Isotopes, Isotones, Isobars, Isomers.
- Packing fraction.
- Nuclear binding energy.
- Nuclear coulomb barrier.
- Rate of ratio active disintegration, half life period, Average life period.
- Rutharford & Sodi's law (Group transfer law)
- Numerical.

Unit : 4 INTRODUCTION TO VOLUMETRIC ANALYSIS

Principle, Mechanism and Applications of,

- Acid-Base Titrations (Only strong acid Vs strong Base).
- Redox Titrations (Only $Fe_{(II)}$ Vs $KMnO_4$)
- Complexo metric Titrations (Only Ca^{+2}/Mg^{+2} Vs EDTA)
- Precipitation Titrations (Only Cl^- Vs $AgNO_3$).
- Related Numericals.

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Chemistry. (SE CH 201)

Semester : II

SUBJECT ELECTIVE PAPER

(Medicinal Chemistry)

Unit : 1 INTRODUCTION

- Introduction of drugs.
- History of medicinal chemistry.
- Classification of drugs.
- General importance of drugs.
- Drug Design.

Unit : 2 ANTI-MALARIAL DRUGS

- Introduction and History.
- Life cycle of Plasmodium.
- Natural anti-malarial drugs :
  Role of activity side in quinine structure
- Classification of anti-malarial drugs.
- Synthesis of Quinoline derivatives :
  8-Amino quinoline derivatives.
  (Plasmoquine & Pamaquine).

Reference :

1. Sanshleshit Auoshadho nu Rasayan by Dr. Anamik Shah.
2. Sanshleshit Auoshadho nu Rasayan by Dr. J.P.Trivedi & Dr.K.A.Thakar.
3. Chemistry of Synthetic Drugs by Dyson & May.

: 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, Oxford, 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.

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.

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F.Y.B.Sc. Semester : II

Chemistry Practical (Laboratory Course) CH LC-201

This syllabus is to be completed by assigning two laboratory sessions per week, etch of two hours. Total laboratory work is 60 hrs/sem (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. Organic Chemistry

1) Identification of an organic compound through the functional group analysis, Determination of melting point and boiling point, Preparation of suitable derivative.
2) Candidate should perform the analysis of at least 10 compounds.

List of compounds

- **Acids:**

Benzoic acid, Cinnamic acid, Phthalic acid, Oxalic acid, Succinic acid.

- **Phenols:**

α–Naphthol, β– Naphthol.

- **Bases:**

p-Toludine, Diphenylamine, Aniline, Methyl aniline.

- **Neutrals:**

Naphthalene, Anthracene, Acetamide, Benzamide, Acetanilide, m-Dinitrobenzene, Urea, Thiourea, Toluene, Acetone, Benzaldehyde, Methy acetate, Ethyl acetate, Ethanol, 1-Propanol, Glycerol, Chloroform, Carbon tetrachloride, Chlorobenzene, Nitrobenzene.

2. Volumetric Titrations

1) To determine the strength of NaOH and Na_2CO_3 present in the solution mixture of NaOH & Na_2CO_3 and to find out their percentage composition.
2) To determine the strength of $NaHCO_3$ and Na_2CO_3 present in the solution mixture of $NaHCO_3$ & Na_2CO_3 and to find out their percentage composition.
3) To determine the Normality, gram/liter and molarities of $H_2C_2O_4, 2H_2O$ and H_2SO_4 present in the solution mixture of $H_2C_2O_4, 2H_2O$ & H_2SO_4 by using X N NaOH and Y N $KMnO_4$ solutions.
4) To determine the Normality, gram/liter and molarity of $H_2C_2O_4, 2H_2O$ and $K_2C_2O_4$ present in the solution mixture of $H_2C_2O_4, 2H_2O$ & $K_2C_2O_4$ by using X N NaOH and Y N $KMnO_4$ solutions.
5) To determine the amount of Ca^{+2} and Mg^{+2} ion by EDTA solution from the mixture solution of $CaCl_2$ and $MgCl_2$.

3. Demonstrations

- Melting point and Boiling point of an organic compound.
- Calibration of burette and Pipette.

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Syllabus According To CBCS Semester pattern

B. Sc. (Biotechnology) Syllabus

(Semester I & II)

(With Effect From June 2011)

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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)

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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**

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Semester 2
(First year B.Sc)

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

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B.Sc Biotechnology

SEMESTER lI

SRMESTER II

Core Compulsory course (CCC I-II)

CBT I-II

Molecules of life

Unit 1

1.1. Overview of major elements involved in formation of biomolecules: C,N,P,S,O,H Water: chemical composition, role of hydrogen bonds, interactions with polar and non polar molecules, Water as reactivate, ionization of water, Solvent properties of water and importance

1.2. Buffers: Buffer systems and buffer system of blood, weak acid and weak base, dissociation constant of weak acid and base ,

1.3. pka values and their importance, pH and pH scale, acid dissociation constant pka and titration curve, Handerson-Hasselbalch equation

1.4. Structure of atoms and molecules and chemical bonds (covalent, ionic, Hydrogen, van der waal's, hydrophobic).

Unit 2

2.1. Carbohydrates Monosaccharides: Nomenclature and Classification, Hawarth and fischer projection.
2.2. Monosaccharide as reducing agent, stereoisomerism
2.3. Disaccharides formation and its biological importance.
2.4. Poly saccharide : types and biological importance

Unit 3

3.1. Amino acid: Classification and properties.
3.2. Proteins: Primary and secondary structure of proteins, tertiary and quaternary structure of proteins
3.3. Vitamins: water soluble and fat soluble vitamins and their biological significance.
3.4. Lipids: Classification, properties and biological importance.

Unit 4

4.1. Nucleotides: structure, chemical properties and functions,
4.2. Structure of DNA double helix
4.3. Alternative forms of DNA.
4.4. Types, structure and biological functions of RNA.

Elective Course (EC2)
EBT II
Biodiversity

Unit 1

1.1. Definition, Introduction
1.2. Types of biodiversity Genetic Diversity ,Species Diversity ,Ecological diversity and functional diversity
1.3. overview of microbial diversity
1.4. overview of plant diversity

Unit 2

2.1. Importance if biodiversity Applications of internet in society.
2.2. Biodiversity conservation
2.3. Loss of biodiversity.
2.4. Role of biotechnology in biodiversity conservation.

Elective Course (EC2)
EBT II
Biocomputing

Unit 1

1.1. Introduction to computer science.
1.2. History and generations of Computer.
1.3. Basics of Hardware components of computer.
1.4. Basics Software components of computer

Unit 2

2.1. Concepts of internet.
2.2. Applications of internet in society
2.3. Concept of HTML,HTTP,URL,Domain,Search engine
2.4. Computer and Internet in Biotechnology

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Semester II

Practical Core Course(PCCI-II)

1. Preparation of standard solutions and buffer solutions
2. Preparation of buffer solutions
3. Operation of pH meter and measurement of pH
4. Qualitative tests for carbohydrates
5. Qualitative tests for Amino acids
6. Titration curve of amino acids and determination of pI, pk1 and pk2
7. Estimation of reducing sugar.
8. Estimation of non reducing sugar.

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PHYSICS

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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.

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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

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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

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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.

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CBCS - Semester - Grading Pattern

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

CC PHY-201

(w.e.f. from June 2011)

Unit – I

(a) Mechanics of a single particle & of particles:

Motion of a particle subjected to a resistive force 3.3(d) [1 to 5], mechanics of a system of particle(3.5), Motion of a system with variable mass(3.6)

(b) Motion in a central force field & Pendulum:

(i) Equivalent one body problem(5.1), Motion in central force field(5.2) General features of the motion(5.3), Motion in a inverse square law force field (5.4) Equation of the orbit(5.5). Kapler's law of planetary motion (5.6)

(ii) Compound Pendulum (6.4), Bar-Pendulum (6.9)

Basic reference: For (a) & (b)(i)

Introduction To Classical Mechanics By R.G. Takwale & P.S.Puranik (Tata McGraw-Hill Publishing Company Ltd.)

Basic reference: For (b)(ii)

Elements of Properties of Matter By D.S.Mathur (S.Chand & Company Ltd.)

Other reference:

1. Mechanics & Electrodynamics By Brij lal, N.Subrahmanyam & Jivan Seshan –(S.Chand & Co.)
2. Classical Mechanics by Goldstain (Narosa Pub.)

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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

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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.

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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

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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

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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 વિષયમાંથી કોઈ પણ એક

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HOME-

SCIENCE

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HD – (201) Introduction to Human Development (Core)

Objectives:

1) To orient the students to the principles of child's growth and development factors that Influence them.
2) To acquaint the students with various concepts and methods of child study.
3) To impart information of the milestone in ground development of children below 2 years.
4) To create awareness regarding child rearing practices.

Unit – 1

(A) Introduction to Human Development
- Need & Scope
- Historical Overview & Theoretical perspectives

(B) Growth and Development
- Meaning and Development
- Principles

Unit – 2

(A) Hearing and Environment.
- Factors influencing – Heredity
- Environment learning, Maturation critical periods.

(B) Prenatal care and development.
- Female reproductive system
- Sign and symptoms of pregnancy
- Prenatal hazards and remedies

Unit – 3

(A) Birth
- Birth process, steps of labor
- Types of birth

(B) Postnatal Development
- Care of mother normal and premature babies
- Child rearing practices – Feeding weaning and supplementary feeding immunization.

Unit – 4

(A)
- Physical development (0 – 2 year)
- Motor development (0 – 2 year)

(B)
- emotional development (0 – 2 year)
- speech development (0 – 2 year)

Reference Books

(1) Hurlock Elizabeth b;, Child Development 6th edition, MC Graw – Hill book company (1978)

(2) Papilla Diane E & olds sally wendkos Human Development, MC Grow – Hill Inc., New York, 5th edition (1992)

(3) Vasta Ross, Haith MMshall M. Millon Scott A, Child psychology, The modern science, John wiky & sons, Inc. New York (1992).

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T.C. – 202 Introduction to Textile and Clothing. (Core)

Objectives:

1) To gain on under standing about textile fibers.

2) To train by giving basic knowledge of needle work for clothing construction.

3) For self development to present one self in various situation.

Unit – 1

(A) Importance and scope of the study of textile & clothing.

(B) Principles of design and effect of lines in fabric.

Unit – 2

(A) Classification of Textile fibers. Its origin and properties.

(B) Textile Definitions.

Unit – 3

(A) Yarn construction.

- Chemical and mechanical spinning
- Types of yards – simple and novelty, twist and ply yarns.

(B) Fabric construction.

- Basic and fancy weave.

Unit – 4

(A) Laundry equipments:

- Washing machine.
- Dryers
- Iron – etc…

(B) Textile finished and its importance.

- Calendaring
- Mercerizing
- Sanforsing
- Water proof finish.

Practical

1) Study of sewing machine, its part and its use.
2) Preparation of different samples.
   (a) Seams – Plain seam, flat felt seam, French seam, Topstitch seam.
   (b) Fasteners – Types hooks, metal eye, buttons.
3) Different hand stitches used in clothes
   (a) Basic stitches – running, hemming slip stitch, back stitch.
   (b) Decorative stitch – stem stitch, chain stitch, satin stitch, Herringbone lazy dazy, French knot.
4) Fullness used in clothes.
   Darts, pleats, tucks and gathers, etc.

Chem. – 203 Applied chemistry (Core)

Objectives:

1) To provide basic knowledge related to organic and in organic chemistry including petrochemicals.
2) To acquaint students with the application of basic knowledge of chemicals ingredient and various organic products.

Unit – 1

- Introduction to organic chemistry sources of organic chemical and importance of organic chemicals.
  Fractional instillation of petroleum.
- Classification of organic compounder, Monelature – IUPAC system, Functional groups and their structural formula, Homologous series and isomerism.

Unit – 2

- Aliphatic series of carbon, general properties of following.
  All cane, Alkane, Alkyne
- Compounds with different functional groups, general properties of following with use.
  Alcohol, Ether.
  Phenol, Aldehydes
  Ketones, Benzenes.

Unit – 3

- Water
- Types of water and its hardness.
- Types of hardness, purification of water.
- Soap and detergents.
  Definition, Preparation, properties, cleaning action, detergents – definition, industrial preparation their properties, Advantages and disadvantages of using soap and detergents.

Unit – 4

A. Brightening agent, optical brightness.
General information of perfumes and flavours.
B. Common Drugs.
Elementary Knowledge of common drugs, general information analysis, Disinfectants.

Practicals:

- Qualitative analysis of organic and inorganic compound.
- Preparation of soap, detergent, shampoo, balm, Vaseline, cold cream.

Reference

- A text book of Applied chemistry by Thankammo Jacob.
- Textbook of 11th and 12th science Gujarat Board.

Bio – 204 General biology (Core)

Objectives

1) To impart basic understanding of biology and introduction to living beings and plants.
2) To introduce basic topics like cell structure and cell division process.
3) To impart knowledge about morphology of typical flowering plant and plant physiology.

Unit – 1

A) General Biology

- Introduction and scope of biology
- Cell plant cell, animal cells its structure and difference between the two.
- Cell Division.

B) Morphology

- Morphology of typical flowering plant.
- Flower its structure and function, fertilization and pollination.
- Root, types of root, modification for special function.

Unit – 2

A) Stem and leaf

- Function of stem, modification for special function.
- Leaf its parts function and types of leaf.
- Modification of leaf for special functions.

B) Seed fruit

- Seed, structure of monocot and disco seed.
- Seed germination and its types.
- Fruit:- types of fruit.

Unit – 3

(A) Plants

- Classification of plants kingdom.
- Plant tissue

(B) Plant physiology

- Osmosis and plarmolysis
- Photosynthesis
- Respiration

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Unit – 4

(A) Animal classification

- Classification of animal kingdom
- Study of different phylum's
- Body organization in animals

(B) Animal tissue

- study of epithelial tissue
- study of connective tissue
- study of nervous tissue

Practical

1) Study of compound microscope.
2) Study of typical flowering plants.
3) Study of flower
4) Study of plant tissue
5) Study of animal tissue
6) Classification of plant kingdom
7) Identification of difference worms
8) Identification of different insects
9) T.S. of sunflower stem, sunflower root
10) T.S. of maize stem
11) Preparation of onion cell slide.

Reference books:

1) Botany – A C Dutta
2) Text book of Gujarat Secondary Board.

FCN – (206) First aid & Community Nursing (Elective)

Objectives:

1) To provide information about principles & importance of first aid.
2) To aware students about importance of health education.
3) To give knowledge about health care & services.
4) To give knowledge about first aid in various situation.

Unit – 1 Introduction

- Meaning, Importance
- Principles, Objectives
- Qualities of person who gives first aid
- First aid box: Components / material of first aid box and its uses
- First aid in heat stock
- First aid in heat burns
- First aid in fever, cough
- First aid in swallowing any thing

Unit – 2 First aid during facture

- First aid during animal and insects bite
- First aid during wounds
- First aid in electric shock

Unit – 3 First aid during hemorrhage

- First aid during attacks
- First aid during person deled in water
- Bandage – importance, Types

Unit – 4 Community Nursing: Basic principles of community nursing,Objectives.Importance, need, Personal hygiene – care of hair, nail, nose, ear, eye etc.

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P.D. – 207 Personality development (Foundation Elective)

Objectives:

1. To understand the concept of personality and personality development and its significance.
2. To understand and develop various traits required for personality development.
3. To acquire knowledge about personality tools and personality theories.

Unit – 1 Introduction

- Personality: Definition, meaning and determinants of personality and its significance, personality pattern.
- Basic personality traits: Introduction
    - Attitude: concept, significance, factors – positive attitude and negative attitude and its effects.
    - Motivation: Significance, Internal and External motive, importance of self motivation, factors feeding to de motivation.

Unit – 2 Self esteem: Concept, symptoms, advantages, Do's and Don'ts to develop positives self esteem, positive and negative self esteem.

- Interpersonal Relationships: Developing positive personality, Analysis of Strengths and Weaknesses.
- Goal setting: Importance of goals
  Factors affecting to goal setting classification of goal

Unit – 3

- Other aspects of Personality Development
- Body language, Assertiveness, Problem-solving, conflict and stress management
- Decision making skills, positive and creative thinking, leadership and qualities of a successful leader, character building, teamwork

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- Lateral thinking, Time management, work ethics, management of change, good manners and etiquettes.

➢ Personality disorders:

Paranoid, schizoid, antisocial, borderline, narcissistic, avoidant, dependent, obsessive.

Unit – 4

➢ Personality Tests.

- Projects techniques : Rerchak inl-blot test, Thematic apperception test, word association test, sociometry

➢ Personality theories

- Freudian stages of development
- Erik – Erickson's stages of development
- Maslow's hierarchy of needs
- Kohlberg's stages
- Contribution of karl jung.

References :

- Block, Jack (2010) The five factor framing of personality and beyond; some ruminations psychological inquiry 21 (1), - 25.
- Organizational Behavior – S.P. Robbins – prentice – Hall of India pvt. ltd.,

PE – 207 Personal Empowerment (Foundation Elective)

Objectives:

(1) The students will become aware of the need, competencies and skill to be developed for empowerment and be motivated for self improvement / self enrichment.

(2) The students will become aware of the role of empowerment of women from the perspectives of personal and national development.

(3) The students will become aware of the interdisciplinary of Home Science education and its potential food personal and professional enhancement.

(4) The student will become sensitized to some pertinent contemporary issues that affect the quality of life of individuals, families and community.

Unit – 1 Personal Growth and Personality Development.

- The challenge: understanding and managing oneself: being aware of one's strengths and weaknesses.
- Personality Development: Factors and influences: emotional and motivational aspects; assertion vs. aggression.
- Peer pressures : Issues and management; group conformity and individualism as co-existing aspects.
- Conflicts and stresses, simple coping strategies.
- Adjustment and readjustment to changing needs and conditions of contemporary society. (technological changes, social changes, changes in values).

Unit – 2 Empowerment of women

- Women and Development: The personal, familial, Societal and national perspectives.
- Capacity building for women; Education, decision – making abilities and opportunities, awareness and information on legal and political issues.
- Women's organizations and collective strength; women's action groups, women's participation in development initiatives.
- Study and discussion of life histories, case studies of illustrious Indian women from different walks of life (e.g. Indira Gandhi, Jashi ki Rani, Medha Patkar, Kiran Bedi, Vijyalaxmi Pandit, Sudha Chandran, Anutai Wagh, Ila Bhatt, Bhanvari Devi).

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Unit – 3

- Home Science Education as Empowerment.
- The interdisciplinary of Home Science Education.
- The role of Home Science Education for personal growth and professional development.
- Home Science as holistic education with integration of goals for persons, enhancement and community development.

Unit – 4

- Some Significant contemporary Issues of concern.
- Gender issues: inequalities and discriminations, biases and stereo types, myths and facts
- Substance abuse: Why and how to say no
- Healthy Habits: In relation, to physique to studies, to heterosexual intereots.
- AIDS: Awareness and education.

Reference:

(1) Adair, J. (1992): The action centred headers, Bombay: Jaico Publication House.

(2) Chandrashekhar, R. (1992): (Ed) Women's Resource and National Development – A perspective, New Delhi: Gaurav Publishing House.

(3) Furhan, A. (1995): Why psychology, London; University College, London Press Ltd.

(4) Garimwood, C. and popple stone, R. (1993); Women management and core, Hong Kong; The Macmillan Press Ltd.

(5) Gupta, J.L. (1988); Challenges to the Fair Sex – Indian women; problems, plight and progresses.

(6) Rather, S. and Brid, J. (1983): Adjustment and Growth; The challenge of Life, New York; C.B.S. College publishing Co.

(7) Singh, R.N. (1992); Sky is the Limit: Practical Guide Lines on Effective career planning, Bombay, Schandra Publication.

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STATISTICS

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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

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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

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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

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GEOLOGY

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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]

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HEMCHANDRACHARYA NORTH GUJARAT UNIVERSITY, PATAN
CBCS - Semester - Grading Pattern
B.Sc. GEOLOGY Practical: SEMESTER-II
CC GEO-104 PR: Optical Mineralogy, Crystallography and Petrology Lab.
(in force from June 2016)

1. **Identification of the following minerals in thin sections:**
   Quartz, Orthoclase, Microcline, Plagioclase, Muscovite, Biotite.

2. **Classification of crystals in to six types. Study of Elements of Symmetry of Eleven (11) types of symmetry.**

3. **Megascopic identification of typical Igneous rocks:**
   Granite, Syenite, Gabbro, Rhyolite, Basalt

4. **Megascopic identification of typical Sedimentary and Metamorphic rocks:**
   Conglomerate, Sandstone, Shale, Limestone, Quartzite, Marble.

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F. Y. B.Sc.

Semester II

GEOLOGY - THEORY and PRACTICALS

Course-wise detail syllabus

GEO 103: Physical Geology, Mineralogy and Petrology Unit Course details

Unit –1 **DYNAMICS OF THE EARTH:** Volcanoes – types, causes, effects, products and distribution. Earthquakes – causes, classification, intensity, effects, seismic belts, seismograph and seismogram, prediction. Mountains – causes, types, distribution.

Unit –2 **OPTICAL MINERALOGY:** Nature of light, Phenomenon of polarisation, Reflection, Refraction, Double refraction, Properties of isotropism, anisotropism. Construction of Nicol prism, Petrological microscope and its parts. Passage of light through Nicol prism.

Unit - 3 **CRYSTALLOGRAPHY:** Definition, Characteristics, Laws of Crystallography, Interfacial angle, Elements of symmetry, Parameters system of Weiss and Miller Indices. Classifications of crystals.

Unit - 4 **PETROLOGY:** Magma: Definition, composition, origin; Definition and classification of rocks Igneous rocks: Origin, classification, common textures, composition and uses. Sedimentary rocks: Origin, classification, consolidation, diagenesis, fabric and textures, composition and uses. Metamorphic rocks: Agents, origin, classification, textures, composition and uses.

Reference Books:

1) Elements of Optical Mineralogy, N. H. Winchel, A. N. Winchel (1968), Willey,
2) The Principles of Petrology, G. W. Tyrell (1960), Asia Publishing House.
3) Petrology, W. T. Haung (1962), Mc. Graw Hill.
4) Dana's Text Book of Mineralogy, Revised by W.E. Ford, Wiley Eastern Ltd., New Delhi.

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GEO 104 PR: Optical Mineralogy, Crystallography and Petrology Lab

Course details.

Identification of the following minerals in thin sections –

Quartz, orthoclase, microcline, plagioclase, muscovite, biotite.

Classification of crystals in to six types. Study of Elements of Symmetry of Eleven (11) types of symmetry.

Megascopic identification of typical rocks:

Granite, Syenite, Gabbro, Rhyolite, Basalt, Conglomerate, Sandstone, Shale, Limestone, Quartzite, Marble.

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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 IIProgramme)

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.

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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**

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FACULTY OF

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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**

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GEOLOGY

PRACTICAL

(Effective from June-2018)
GEO 201 PR-1

Common Formula for Question Paper (Practical Course)

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

Practical Examination Pattern:

1. Identify the given Megascopic Rock sample. Give the texture, Mineral constituents and Conclusion of it. Also give the name of the Rock.

2. Identify the Microscopic Mineral section. Write a microscopic properties of it. Give the name of minerals and draw a section of over the polarizer and between the crossed nicols.

3. Identify the given Crystal model and Write the Axial ratio, System, Symmetry, Class, Type, Combination forms and Mineral name.

4. Viva-voce.

5. Journal Work.

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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 – II						
	Core Compulsory (CC) Course					
GEO 201	Physical Geology, Mineralogy and Petrology	4	30	70	100	4
CC-II-2	Core Course	4	30	70	100	4
CC-III-2	Core Course	4	30	70	100	4
	Practical core (PC) Course					
GEO 201 PR-1	Optical Mineralogy, Crystallography and Petrology Lab.	4		50	50	2
PC-II-2	Practical Core Course	4		50	50	2
PC-III-2	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 - Basics of geomorphology	2		50	50	2
		30	**105**	**495**	**600**	**24**

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F. Y. B.Sc.

Semester II

GEOLOGY - THEORY and PRACTICALS

Course-wise detail syllabus

GEO 201: Physical Geology, Mineralogy and Petrology

Unit	Course details
Unit –1	DYNAMICS OF THE EARTH: Volcanoes – types, causes, effects, products and distribution. Earthquakes – causes, classification, intensity, effects, seismic belts, seismograph and seismogram, prediction. Mountains – causes, types, distribution.
Unit –2	OPTICAL MINERALOGY: Nature of light, Phenomenon of polarisation, Reflection, Refraction, Double refraction, Properties of isotropism, anisotropism. Construction of Nicol prism, Petrological microscope and its parts. Passage of light through Nicol prism.
Unit - 3	CRYSTALLOGRAPHY: Definition, Characteristics, Laws of Crystallography, Interfacial angle, Elements of symmetry, Parameters system of Weiss and Miller Indices. Classifications of crystals.
Unit - 4	PETROLOGY: Magma: Definition, composition, origin; Definition and classification of rocks **Igneous rocks:** Origin, classification, common textures, composition and uses. **Sedimentary rocks:** Origin, classification, consolidation, diagenesis, fabric and textures, composition and uses. **Metamorphic rocks:** Agents, origin, classification, textures, composition and uses.

Reference Books:

1) Elements of Optical Mineralogy, N. H. Winchel, A. N. Winchel (1968), Willey,
2) The Principles of Petrology, G. W. Tyrell (1960), Asia Publishing House.
3) Petrology, W. T. Haung (1962), Mc. Graw Hill.
4) Dana's Text Book of Mineralogy, Revised by W.E. Ford, Wiley Eastern Ltd. New Delhi.

GEO 202 (CSE): BASICS OF GEOMORPHOLOGY

Unit	Course details	Credits
Unit–1	Geomorphology- Basic geologicalprocess and its effects on landscape.	**1**
Unit–2	Major depositional and erosional landforms associated with coasts, rivers and deserts..	**1**

GEO 201 PR-1: Optical Mineralogy, Crystallography and Petrology Lab.

Course details
Identification of the following minerals in thin sections – Quartz, orthoclase, microcline, plagioclase, muscovite, biotite.
Classification of crystals in to six types. Study of Elements of Symmetry of Eleven (11) types of symmetry.
Megascopic identification of typical rocks: Granite, Syenite, Gabbro, Rhyolite, Basalt, Conglomerate, Sandstone, Shale, Limestone, Quartzite, Marble.

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