UNIVERSITY OF CALICUT

Abstract
BVoc programme in Gemmology – under Modified BVoc Regulations 2014 – Scheme and Syllabus - implemented w.e.f 2014 admission onwards - Orders issued

G & A - IV - J
Dated, Calicut University P.O, 09.09.2015

Read:–1. Minutes of the meeting of the Principals of the colleges got permission to start BVoc programmes and Community College programme held on 19.06.14
3. U.O.No. 2650/2015/Admn Dtd :17.03.2015
4. Item No.3 in the Minutes of the Board of Studies in Geology held on 26.05.2015
5. Minutes of the meeting of the Faculty of Science held on 28.05.2015
6. Item No.II D in the minutes of the LXXIII meeting of the Academic Council held on 11.07.2015
7. Circular No. 53986/GA - I - F 1/2015/Admn dated 04.08.2015

ORDER
As per the paper read as (1) above the Draft Regulations for BVoc Programmes have been prepared.

As per paper read as (2) The BVoc Regulations have been implemented and as per paper read as (3) the Modified BVoc Regulations have been finalised and implemented.

Vide paper read as (4), Board of Studies in Geology approved the syllabus for BVoc programme in Gemmology.

Faculty of Science vide paper read as (5) approved the resolution of the Board.

Academic Council also approved the same, vide paper read as (6).

Vide paper read as (7) Vice Chancellor has given orders to implement the decisions of Academic Council.

Sanction has, therefore, been accorded for the implementation of the Scheme and Syllabus of BVoc programme in Gemmology under BVoc Regulations 2014, in the University, w.e.f 2014 Admissions.

Orders are issued accordingly.

(The syllabus is available in the website: universityofcalicut.info)

Usha K
Deputy Registrar

To
The Principals of all Colleges having B.Voc Programme
Copy to: Pareeksha Bhavan

Forwarded / By Order
Section Officer
UNIVERSITY OF CALICUT

B.Voc. Programme in
GEMMOLOGY
Semester I
 Semester 1

GEC1EG01 : ENGLISH - THE FOUR SKILLS FOR COMMUNICATION

Course No: 1.1
Course Code: GEC1EG01
Course Name: The Four Skills for Communication
Credits: 4
Hours: 60

ENG1 A01: THE FOUR SKILLS FOR COMMUNICATION

1. OBJECTIVES OF THE COURSE

To train learners in the Basic English Language Skills, word building, soft skills and effective communication

2. COURSE DESCRIPTION

Module 1: English for Communication 10 hours
Module 2: Primary Skills 15 hours
Module 3: Secondary Skills 15 hours
Module 4: Grammar 20 hours
Evaluation 12 hours
Total 72 hours

COURSE CODE ENG1 A01

<table>
<thead>
<tr>
<th>COURSE CODE</th>
<th>ENG1 A01</th>
</tr>
</thead>
<tbody>
<tr>
<td>TITLE OF THE COURSE</td>
<td>THE FOUR SKILLS FOR COMMUNICATION</td>
</tr>
<tr>
<td>SEMESTER IN WHICH THE COURSE TO BE TAUGHT</td>
<td>1</td>
</tr>
<tr>
<td>NO. OF CREDITS</td>
<td>3</td>
</tr>
<tr>
<td>NO. OF CONTACT HOURS</td>
<td>72 (4 hours/ week)</td>
</tr>
</tbody>
</table>

A. Core Text

Module 1. English for Communication
1. Communication and Language
2. English as a Global Language

Module 2. Primary Skills
1. Listening
   1. Listening to a conversation
   2. Listening to a speech
   3. Listening to a lecture
2. Speaking
   1. Greeting
   2. Thanking
   3. Requesting
   4. Enquiring
   5. Explaining
   6. Reporting
   7. Permission
8. Pronunciations of English
   i. Introduction to phonetics
   ii. Received Pronunciation
   iii. Vowels and Consonants
   iv. Syllables and Word Stress

Module 3. Secondary Skills
1. Reading
1. News reports
2. Charts
3. Advertisements
4. Official Letters/Documents
5. Online Content
6. Reading Poem" An October morning"
7. Reading Poem" Hawk Roosting"
8. Reading the essay," How to escape from intellectual rubbish"
9. Reading the essay "On the need for a quiet college"

2. Writing
1. Sentence
2. Paragraphs
3. Reports
4. Letters
5. Resumes and Cover Letters
6. Emails
7. Making Notes
8. Blogs
9. Punctuations

Module 4. Grammar
1. Word Class
2. Subject – Verb Agreement
3. Tenses
4. Articles
5. Phrases, Clauses and Sentences
6. Voices
7. Idioms

Appendix

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Author</th>
<th>Publisher &amp; Year</th>
</tr>
</thead>
<tbody>
<tr>
<td>ENG1A01</td>
<td><em>The Four Skills for Communication</em></td>
<td>Dr. Josh Sreedharan</td>
<td>Cambridge UP, 2014</td>
</tr>
</tbody>
</table>
Semester I

GEC1ML02 : MALAYALAM BHASHAYAM SAHITHYAVUM-I

Course No: 1.2
Course Code: GEC1ML02
Course Name: Bhashayum Sahithyavum-I
Credits: 4
Hours: 60


drumamgavum

"drumamgavum"

"drumamgavum"

"drumamgavum"

"drumamgavum"

"drumamgavum"

"drumamgavum"

"drumamgavum"

"drumamgavum"

"drumamgavum"

"drumamgavum"

"drumamgavum"

"drumamgavum"

"drumamgavum"

"drumamgavum"

"drumamgavum"

"drumamgavum"

"drumamgavum"
Semester I
GEC1IC03 : INTRODUCTION TO COMPUTER

Course No: 1.3
Course Code: GEC1IC03
Course Name: Introduction to Computer
Credits: 4
Hours: 60

BMM1C01 – Introduction To Computer

UNIT 1: Computer basics – CPU, memory and storage devices; input/output devices; communication devices; operating systems – DOS, Windows, Linux, Unix; Cross-platforms problems and solutions; workstations; networks.


Semester 1

SDC1GM01 : GEMMOLOGY PAPER I

Course No: 14
Course Code: SDC1GM01
Course Name: GEMMOLOGY PAPER 1
Credits: 3
Hours: 45

Introduction- the evolution of science of gemology, essential qualities of gem material, organic & inorganic gems, the geological formation & occurrence of Gemstones: the formation of gemstones in earth’s crust. Groups, species and varieties, the major gem occurrence of the world, mining techniques. The chemical composition of gemstones. Classification of gemstones, visual observation-4 C’s of gemstones, phenomenal varieties,

Chemical bonding and crystallography – Atomic structure, types of chemical bonds, shape of molecules, crystalline and amorphous materials, crystal symmetry, crystal forms, crystal habits, seven crystal systems, twinning, isomorphous substitution, crystalline polymorphism.

Physical properties of gemstones – Hardness, Moh's scale, application in gemmology. Diamond identification methods – hardness pencil, directional hardness, cleavage, etc. Specific gravity – Definition, Determination, hydrostatic weighing, the use of high density liquids in gem testing, flotation and pycnometer method.


References:

3. Gems: Their Sources, Descriptions and Identification edited by Michael O'Donoghue

Semester 1

SDC1GM02 : GEMMOLOGY PAPER II

Course No: 1.5
Course Code: SDC1GM02
Course Name: GEMMOLOGY PAPER II
Credits: 3
Hours: 45

Introduction of navarathna, Diamond and diamond simulants, Emerald and emerald simulants, ruby and ruby simulants, blue sapphire and sapphire simulants, yellow sapphire simulants coral and simulants, pearl and simulants, hessonite garnet and simulants, chrysoberyl, cat’s eye and simulants.

References:


Semester 1

SDC1GM03 (P) : Fundamentals of Gemmology-I

Course No: 1.6
Course Code: SDC1GM03 (P)
Course Name: Fundamentals of Gemmology - I
Credits: 6
Hours: 90

1. Visual Observation

2. Luster
3. Phenomenon
4. Surface Markings
5. Colour
6. Specific Gravity
7. Polariscope
8. Dichroscope

References:


Semester 1

SDC1GM03(P) : Practicals on Fundamentals of Gemmology-II

Course No: 1.7
Course Code: SDC1GM03(P)
Course Name: Practicals on Fundamentals of Gemmology-II Credits: 6
Hours: 90

1. Refractometer
2. Microscope
3. 10x Lens
4. Chelsea Filter
5. U.V Lamp

References:
4. The art & craft of Jewellery by Janet Fitch

Semester II

GEC2EG04 : MODERN PROSE AND DRAMA

Course No: 2.1
Course Code: GEC1EG04
Course Name: Modern Prose and Drama
ENG1 A02: MODERN PROSE AND DRAMA

1. OBJECTIVE OF THE COURSE
   a. To introduce learners to representative English prose from different cultural
      and geographical backgrounds
   b. To cultivate their tastes in drama
   c. To expose to logical and imaginative writing

3. COURSE DESCRIPTION
   Module 1: Prose  40 hours
   Module 2: Drama  40 hours
   Evaluation:  10 hours
   Total: 90 hours

<table>
<thead>
<tr>
<th>COURSE CODE</th>
<th>ENG1 A02</th>
</tr>
</thead>
<tbody>
<tr>
<td>TITLE OF THE COURSE</td>
<td>MODERN PROSE AND DRAMA</td>
</tr>
<tr>
<td>SEMESTER IN WHICH THE COURSE TO BE TAUGHT</td>
<td>1</td>
</tr>
<tr>
<td>NO. OF CREDITS</td>
<td>3</td>
</tr>
<tr>
<td>NO. OF CONTACT HOURS</td>
<td>90(5hrs/wk)</td>
</tr>
</tbody>
</table>

COURSE CODE ENG1 A02

A. Core Text
Module 1. Prose

1. Gandhiji as a School Master: M.K.Gandhi
2. Women’s Role in the National Movement: Subhash Chandra Bose
3. Martin Luther King and Africa: Chinua Achebe
4. Ambedkar’s Constituent Assembly Speech: Dr.B.R.Ambedkar
5. Why I Want a Wife: Judy Brady
6. In Search of Sweet Peas: Ruskin Bond

Module 2. Drama
1. Never Never Nest: Cedric Mount
2. Refund: Fritz Karinthy
3. Soul Gone Home: Langston Hughes

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Author</th>
<th>Publisher &amp; Year</th>
</tr>
</thead>
<tbody>
<tr>
<td>ENG1 A02</td>
<td>Modern Prose and Drama</td>
<td>Dr. Zainul Abid Kotta</td>
<td>Oxford UP, 2014</td>
</tr>
</tbody>
</table>

Semester II
GEC2ML05 : MALAYALAM – BHASHAYUM SAHITHYAVUM-II

Course No: 2.2
Course Code: GEC1ML05
Course Name: Bhashayum Sahithyavum-II
Credits: 4
Hours: 60
Semester II  
GEC2HA05 : HISTORY AND THEORY OF ART

Course No: 2.3  
Course Code: GEC2HA05  
Course Name: History and Theory of Art  
Credits: 4  
Hours: 60

Course Code - VCM3B05  
Course Title - History and Theory of Art

UNIT 1:  
Fundamentals of art, Drawing, Geometrical drawing, line space, balance, and harmony, angles and viewpoint, perspective. Tonal variations, texture of objects and forms, colour schemes, colour combinations, composition and values.

UNIT 2:  
Brief history of art. Classical art, murals, papyrus manuscripts, hieroglyphics, Mughal art, medieval art, Byzantine and Gothic, Renaissance, Baroque and Rocco, Romanticism and Realism.

Unit 3:  
Modernism in the West: Impressionism, Symbolism, Expressionism, Cubism, Futurism, Constructivism, Dada, Surrealism, Abstract expressionism, pop art, performance art, postmodern art and architecture.

UNIT 4:  

REFERENCE:
Semester II
SDC2GM05 : GEMMOLOGY PAPER III

Course No: 2.4
Course Code: SDC2GM05
Course Name: GEMMOLOGY PAPER III
Credits: 3
Hours: 45

Metals and their Behaviour

Characteristics and classification, ores, metal groups-ferrous, non-ferrous, alloys, mining and techniques-surface mining, subsurface mining and types. Basic techniques of jewellery making- measurement, layout, sawing, drilling, filing.

Precious metals and their mining, methods of refinement and recovery, application in jewellery, quality control – lowering or raising metal quality, hallmarking, standard weights and measures

Gemstones, group, species, and variety

Identification of organic gemstones

Identification of refractive index range 1.4 - 1.5

Refractive index range 1.5- 1.6

Refractive index range 1.6-1.7

Refractive index range 1.7-1.8

Refractive index range 1.8 over range stones

References:
3. Turquoise Unearthed by Joe Dan Lowry and Joe P. Lowry.


Semester II
SDC2GM06 : GEMMOLOGY PAPER IV

Course No: 2.5
Course Code: SDC2GM06
Course Name: GEMMOLOGY PAPER IV
Credits: 3
Hours: 45

Bleaching, Coating, Spraying and Foiling, Impregnation, Fracture filling (colourless), Filling of pores (Pores stones) – Colourless, Coloured impregnation (Dyeing), Heat Treatment, Diffusion Treatment, High Pressure high temperature treatment, Graphitization, Laser Drilling, Heat treatment in ruby and sapphires with different kinds of residuals, Irradiation.

References:


Semester II
SDC2GM07(P) : Practical on Gemstones

Course No: 2.6
Course Code: SDC 2GM07(P)
Course Name: Practical on Gemstones
Credits: 6
Hours: 90

1. Identification of Emerald
2. Identification of ruby
3. Identification of blue sapphire
4. Identification of yellow sapphire

Identification of organic gemstones
Identification of refractive index range 1.4 - 1.5
Refractive index range 1.5 - 1.6

References:


Semester III
Semester III
GEC3EG07 : ENGLISH – INSPIRING EXPRESSIONS
Course No: 3.1
Course Code: GEC3EG07
Course Name: Inspiring Expressions
Credits: 4
Hours: 60
ENG2 A03 INSPIRING EXPRESSIONS

<table>
<thead>
<tr>
<th>COURSE CODE</th>
<th>ENG2 A03</th>
</tr>
</thead>
<tbody>
<tr>
<td>TITLE OF THE COURSE</td>
<td>INSPIRING EXPRESSIONS</td>
</tr>
<tr>
<td>SEMESTER IN WHICH THE COURSE TO BE TAUGHT</td>
<td>2</td>
</tr>
<tr>
<td>NO. OF CREDITS</td>
<td>4</td>
</tr>
<tr>
<td>NO. OF CONTACT HOURS</td>
<td>72(4hrs/wk)</td>
</tr>
</tbody>
</table>

1. OBJECTIVES OF THE COURSE
   a. To acquaint the students with Short Stories
   b. To cultivate their tastes in English Poetry
   c. To expose to imaginative writing

2. COURSE OUTLINE
   1. Module 1. Poems 30 Hrs
   2. Module 2. Short Stories 30 Hours
   3. Evaluation 12 hours
   Total 72 Hours

COURSE CODE ENG2 A03

A. Core Text

Module 1. Poetry

1. “On his Blindness”: John Milton
2. “To his Coy Mistress”: Andrew Marvel
3. “Ulysses”: Lord Tennyson
4. “Ode to Nightingale”: John Keats
5. “My Last Duchess”: Robert Browning
6. “Indian Summer”: Jayanth Mahapatra
7. “Journey of the Magi”: T.S. Eliot

Module 2. Short Stories

1. The Luncheon: Somerset Maugham
2. Karma: Kushwant Singh
3. The Model Millionaire: Oscar Wilde
4. The Night the Ghost Got in: James Thurber

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Author</th>
<th>Publisher &amp; Year</th>
</tr>
</thead>
<tbody>
<tr>
<td>ENG2 A03</td>
<td>Inspiring Expressions</td>
<td>Prof. Muhammed Ayub Kallingal</td>
<td>Black Swan, 2014</td>
</tr>
</tbody>
</table>
GEC3CY08 : CRYSTALLOGRAPHY

Course No: 3.2  
Course Code: GEC3CY08  
Course Name: Crystallography  
Credits: 4  
Hours: 60

Module 1:

Definition of crystal; Morphological characters of crystal – faces, forms, edges solidangles  
Interfacial angle; Contact Goniometer

Symmetry elements – crystallographic axes, crystal notation, parameter system of Weiss and  
Miller indices, axial ratio

Laws of crystallography – law of constancy of symmetry, law of constancy of interfacial angles,  
law of rational indices

Classification of crystals into systems and classes – Holohedral, Hemihedral, Hemimorphic and  
Enantiomorphic forms in crystals

Module 2:

Study of the symmetry elements and forms of the Normal, pyritohedral, tetrahedral and  
plagiohedral classes of cubic system with special reference to well developed crystals of Galena,  
Spinel, Garnet, Flourite, Diamond, Pyrite, Tetrahedrite, Boracite and Cuprite.

Module 3:

Study of symmetry elements and forms of Normal, Hemimorphic, Tripyramidal, Pyramidal  
Hemimorphic, Sphenoidal and Trapezphedral classes of Tetragonal system with special reference  
to well developed crystals of zircon, Rutile, Cassiterite, Vesuvianite, Apophyllite, Scheelite,  
Meionite, Wulfenite and Chalcopyrite.

Module 4:

Study of the symmetry elements and forms of Normal, Hemimorphic, Tripyramidal, Pyramidal  
hemimorphic, Trapezohedral, Rhombohedral, Rhombohedral Hemimorphic, Trirhombohedral  
and Trapezohedral classes of Hexagonal system with special reference to well developed crystals  
of Beryl, Zincite, Apatite, Calcite, Corundum, Tourmaline, Phenacite and Quartz.
Study of the symmetry elements and forms of the Normal, Hemimorphic and Sphenoidal classes of Orthorhombic system with special reference to well developed crystals of Barite, Olivine Topaz, Staurolite, Sulphur, Calamine, Struvite and Epsomite.

Module 5:

Study of the symmetry elements and forms of the Normal classes of the Monoclinic and Triclinic systems with special reference to well developed crystals of Gypsum, Orthoclase, Albite, Augite, Axinite and Kyanite.

Twin crystals – Definitions – Effects of Twinning – laws of twinning – composition plane, twinning plane and twinning axis, indices of twins – simple and repeated (polysynthetic twins), contact and penetration twins: secondary twins. Study of twin laws pertaining to the following crystals – Fluorite (Spinel law), Pyrite (iron cross twin), Rutile (geniculate), Calcite, Quartz (Brazil laws), Aragonite (mimetic twin), Staurolite (cruciform), Gypsum, Augite and Feldspars (Carlsbad, Baveno, Manebach, Albite and Pericline)

Essential Reading:

Semester III
GEC3IM09 : INDIAN MINERAL DEPOSITS

Course No: 3.3
Course Code: GEC3IM09
Course Name: Indian Mineral Deposits
Credits: 4
Hours: 60

Module 1:
Diagnostic physical properties, chemical composition, uses, modes of occurrence and distribution in India of the following:

Economic Minerals - Gold, Silver, Copper, Lead, Zinc, Iron, Manganese, Chromium, Tin, Aluminium
Module 2:
Radioactive metals - Thorium, Uranium, and Titanium.
Industrial Minerals - Asbestos, Barite, Graphite, Gypsum and Mica.

Module 3:
Abrasives - Diamond, Corundum, Emery garnet, Abrasive sand, Tripoli, Pumice, Sand feldspar, Limestone, Clay, Talc etc.
Refractories - fireclay, graphite, Dolomite and sillimanite group of minerals, diaspor, pyrophillite, zircon etc
Ceramic minerals - Clay, Feldspar, Wollastonite,
Gemstones.

Module 4:
Fossil fuels – coal and lignite – uses, classification, constitution, origin and distribution in India.
Petroleum- composition, uses, theories of origin, oil traps, and important oil fields of India.

Module 5:
A brief account of mineral deposits in Kerala.
Significance of minerals in National Economy.
Strategic, critical and essential minerals

Essential Readings:

Semester III

SDC 3GM09 : ADVANCED GEMMOLOGY PAPER I

Course No: 3.4
Course Code: SDC3GM09
Course Name: ADVANCED GEMMOLOGY PAPER I
Credits: 3  
Hours: 45

Flame fusion (Verneuil Process), Czochralski (Crystal pulling), Skull melting process, Flux fusion process, hydrothermal process, gel growth, ceramic process, diamond synthesis process, high pressure high temperature growth, carbon vapour deposition growth, sublimation method, glasses, composites

References:

Semester III

BV3GM10: ADVANCED GEMMOLOGY PAPER II

Course No: 3.5  
Course Code: BV3GM10  
Course Name: ADVANCED GEMMOLOGY PAPER II  
Credits: 3  
Hours: 45

Factors affecting the pricing of gemstones, 4-C’s of gemstones, Rarity, Colour- depth of colour, hue of colour, saturation and tone, Pleochroism – dichroism and trichroism, Phenomenal gem stones (Chatoyancy, asterism, opalescence, sheen, aventurescence, change of colour, play of colour, iridescence, orient, adularescence, Fracture/Cleavage nature and its position, Types of
shape and cuts (Brilliant cut, step cut, mixed cut, cabochon, tumbled, beed, cameo, intaglio, plaque), Types of luster (metallic, adamantine, vitreous, greasy, waxy, dull, silky, pearly), Types of transparency (transparent, semi transparent, translucent, semi translucent, opaque, over coloured stones), Size of the gemstone and carat weight.

References:


Semester III

BV3GM11(P) : Practical on natural & synthetic gemstones

Course No: 2.6
Course Code: BV3GM11(P)
Course Name: Practical on natural & synthetic gemstones
Credits: 6
Hours: 90

1. Identification of coral
2. Identification of pearl
3. Identification of hessonite garnet
4. Identification of chrysoberyl cat’s eye
5. Identification of various synthetic stones - synthetic method identification

References:


Semester III

**BV3GM12(P) : Practicals on synthetic and treated gemstones**

Course No: 3.7  
Course Code: BV3GM12(P)  
Course Name: Practicals on synthetic and treated gemstones  
Credits: 6  
Hours: 90

Refractive index range 1.6-1.7  
Refractive index range 1.7-1.8  
Refractive index range 1.8 over range stones

Identification of Bleached sample, Coated sample, Spraying and Foiling, Fracture filling (colourless), Filling of pores (Pores stones) – Colourless, Coloured impregnation (Dyeing), Heat Treatment, Diffusion Treatment, Heat treatment in ruby and sapphires with different kinds of residuals, Irradiation, High Pressure high temperature treatment, Graphitization, Laser Drilling,

References:


Semester IV
Semester IV
GEC4EG10 : ENGLISH – READINGS ON SOCIETY

Course No: 4.1
Course Code: GEC4EG10
Course Name: Readings on Society
Credits: 4
Hours: 60

ENG2 A04  Readings on Society

<table>
<thead>
<tr>
<th>COURSE CODE</th>
<th>ENG2 A04</th>
</tr>
</thead>
<tbody>
<tr>
<td>TITLE OF THE COURSE</td>
<td>READINGS ON SOCIETY</td>
</tr>
<tr>
<td>SEMESTER IN WHICH THE COURSE TO BE TAUGHT</td>
<td>2</td>
</tr>
<tr>
<td>NO. OF CREDITS</td>
<td>4</td>
</tr>
<tr>
<td>NO. OF CONTACT HOURS</td>
<td>90(5hrs/wk)</td>
</tr>
</tbody>
</table>

1. Objectives of the Course
   a. To introduce learners to various issues in the contemporary society
   b. To create an awareness of preservation of the environment and nature
   c. To inculcate the spirit of social life, values, duties and rights

2. COURSE DESCRIPTION

Module 1: Social Issues  20 hours
Module 2: Environment 20 hours
Module 3: Gender 20 hours
Module 4: Human Rights 18 hours
Evaluation 12 hours
Total 90 hours

COURSE CODE ENG2 A04
A. Core Text

Module 1. Social Issues

1. The Social Cause of Economic Globalization: Vandana Siva
2. Unity Amidst Diversity: Dr. Rajendra Prasad

Module 2. Environment

1. Man and Nature in India: Dr. Salim Ali
2. Climatic Change in Human Strategy: E.K. Federov
Module 3. Gender
1. Widow: G. Venkat Chalam
2. More than 100 million Women Missing: Amartya Sen

Module 4. Human Rights
1. Stigma, Shame and Silence: Kalpana Jain
2. I am Happy, Don’t you believe: Santhosh John Thooval

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Author</th>
<th>Publisher &amp; Year</th>
</tr>
</thead>
<tbody>
<tr>
<td>ENG2 A04</td>
<td><em>Readings on Society</em></td>
<td>Dr. K.P. Nanda Kumar</td>
<td>Cosmo, 2014</td>
</tr>
</tbody>
</table>

Semester IV
GEC4MY11 : MINERALOGY

Course No: 4.2
Course Code: GEC4MY11
Course Name: Mineralogy
Credits: 4
Hours: 60

Module 1:

Structure and classification of silicates; Compositional variation and coupled ionic substitution, Isomorphism, Polymorphism, Pseudomorphism, solid solution and exsolution in minerals

Physical properties of minerals depending upon cohesion and elasticity, specific gravity, light, heat, electricity, magnetism and the senses. Determination of specific gravity of minerals – Joly’s spring balance and Walker’s steelyard methods

Module 2:
Nature of light – Ordinary and polarized light; Refraction and reflection; Refractive index, Critical angle and Total internal reflection. Double refraction – Plane Polarization by Reflection; Plane polarization by Refraction; Nicol Prism; Plane polarization by absorption; Polaroid.
Petrological microscope and its parts – Optical accessories, their construction and uses – Quartz wedge (Determination of order of Interference Colour), Gypsum plate and Mica plate (Determination of Fast and Slow vibration directions)

Module 3:

Optical classification of minerals; Isotropic and anisotropic minerals
Optical properties of isotropic and anisotropic minerals observed under parallel and crossed Nicols
Extinction – Types, angles, determination, and uses
Characters of Uniaxial and biaxial minerals – Optic axis and optic axial angle; Acute and Obtuse Bisectrix; Optic sign of Uniaxial and Biaxial minerals; Uniaxial and Biaxial Indicatrix; Sign of elongation; Optical anomalies

Module 4:

Mineralogy, Structure, Chemistry, Optical and Physical properties, Modes of occurrence and uses of the following groups of minerals: Olivine, Garnet, Epidote, Aluminium silicates, Pyroxene, Amphiboles, Mica, Chlorite, Feldspars, Feldspathoids and Zeolites.

Module 5:

Mineralogy, Structure, Chemistry, Optical and Physical properties, Modes of occurrences and industrial uses of the following minerals: Polymorph and varieties of Quartz, Scapolite, Cordierite, Talc, Serpentine, Steatite, Calcite, Dolomite, Topaz, Staurolite, Beryl, Tourmaline, Fluorite, Apatite, Zircon, Rutile, Sphene and Corundum.

Essential Reading:
5. Kerr, P.F., Optical Mineralogy.
7. Battey, M.H., Mineralogy for students.
Semester IV

GEC4ED12 : ENTREPRENEURSHIP DEVELOPMENT

Course No: 4.3
Course Code: GEC4ED11
Course Name: ENTREPRENEURSHIP DEVELOPMENT
Credits: 4
Hours: 60
Objectives:
- To familiarise the students with the concept of entrepreneurship.
- To identify and develop the entrepreneurial talents of the students.
- To generate innovative business ideas in the emerging industrial scenario.

Module I

20 Hours

Module II

10 Hours

Module III

30 Hours

Module IV
Identification of Business Opportunities in the Context of Kerala: Rate of ED Clubs – Industrial Policies – Skill development for entrepreneurs – Business Incubation: Meaning - Setting up of Business Incubation Centres.

15 Hours

Reference Books:

Module 3. Gender
1. Widow: G. Venkat Chalam
2. More than 100 million Women Missing : Amartya Sen

Module 4. Human Rights
1. Stigma, Shame and Silence: Kalpana Jain
2. I am Happy, Don’t you believe : Santhosh John Thooval

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Author</th>
<th>Publisher &amp; Year</th>
</tr>
</thead>
<tbody>
<tr>
<td>ENG2 A04</td>
<td><em>Readings on Society</em></td>
<td>Dr. K.P. Nanda Kumar</td>
<td>Cosmo, 2014</td>
</tr>
</tbody>
</table>

Semester IV
SDC4GM13 : ADVANCED GEMMOLOGY PAPER III

Course No: 4.4
Course Code: SDC4GM13
Course Name: ADVANCED GEMMOLOGY PAPER III
Credits: 3
Hours: 45

Classes of work, Precious gem stones, Birthstones, Where to find material, Cutting material, Hardness of minerals, Abrasives, Grinding wheels, Cabochon cutting, Equipment for gem cutting, Four main operations, Sawing, Sawing outfits, Truing saw disks, Mud Sawing, Diamond charged saws, Charging a diamond saw, Grinding, Sanding, Polishing, Dopping, Drilling, How to cut a sphere, Making a doublet, Horizontal laps, Ash trays, Facet cutting.

References:


3. Faceting History: Cutting Diamonds & Colored Stones by **Glenn Klein**
   publisher Xlibris Corporation, 2005, ISBN- 1599260824, 9781599260822

4. The Handbook of Engraved Gems by **Charles William King**, Bell & Daldy, 1866, e-book


6. Antique Jewellery: Its Manufacture, Materials, and Design

---

**Semester IV**

**SDC4GM14 : Pearls and Culturing of Pearls**

Course No: 4.5  
Course Code: SDC4GM14  
Course Name: Pearls and Culturing of Pearls  
Credits: 3  
Hours: 45

History of Pearls and Pearl culture, taxonomy and distribution, ecology and biology, culture of pearl oysters, pearl production, marketing of pearls.

Reference:

1. The Biology and Culture of Pearl Oysters (Bivalvia Pteriidae), M. H. Gervis, Neil Anthony Sims  
   World Fish, 1992 - Cultured pearls

2. The Pearl Oyster (Google eBook), Paul Southgate, John Lucas , Elsevier, 19-Aug-2011 - **Science**
Factors affecting the pricing of gemstones

4-C’s of gemstones

Rarity

Colour - depth of colour, hue of colour, saturation and tone

Pleochroism – dichroism and trichroism

Phenomenal gemstones (Chatoyancy, asterism, opalescence, sheen, aventurescence, change of colour, play of colour, iridescence, orient, adularescence.

Fracture /Cleavage  nature and its position

Types of shape and cuts (Brilliant cut, step cut, mixed cut, cabochon, tumbled, beed, cameo, intaglio, plaque)

Types of luster (metallic, adamantine, vitreous, greasy, waxy, dull, silky, pearly)
Types of transparency (transparent, semi transparent, translucent, semi translucent, opaque, over coloured stones)

Size of the gemstone and carat weight
Semester V
GEC5HR13-HUMAN RESOURCES MANAGEMENT
Course No: 5.1
Course Code: GEC5HR13
Course Name: HUMAN RESOURCES MANAGEMENT
Credits: 4
Hours: 60

BC5B09 HUMAN RESOURCES MANAGEMENT
Objectives:

- To familiarize the students with the different aspects of managing human resources in an organization.
- To equip the students with basic knowledge and skills required for the acquisition, development and retention of human resources.

Module I

20 Hours

Module II

15 Hours

Module III

15 Hours

Module IV
Compensation Management: Compensation planning – Objectives – Wage systems – Factors influencing wage system – Components of employee remuneration – Basic wage – Dearness Allowance – Bonus – Fringe benefits and incentives

15 Hours


10 hours

Reference Books:

7. Aswathappa, K., Human Resource Management
9. Michael Porter. HRM and Human Relations
Semester V
GEC5PP14 : PSYCHOLOGY AND PERSONAL GROWTH

Course No: 5.2
Course Code: GEC5PP14
Course Name: LIFE SKILL DEVELOPMENT
Credits: 4
Hours: 60

CPY5D01  PSYCHOLOGY AND PERSONAL GROWTH
The contents and teaching of this part is general and designed to suit as a general or peripheral paper for non-Psychology main students. The class room interaction should focus on experiential component of learning apart from the usual lectures

1. **Psychology**: - The subject matter and scope-Branches of Psychology and its application in personal and social life– Brief out line of transactional analysis and Positive Psychology.

2. **Concept of Happiness**: - Basic nature of emotional development. Positive and negative emotional state. Control of emotional states. Happiness – causes and effect of happiness application in day to day life. Hope and Optimistic Behaviour-General concepts.


4. **Positive Social Relations**: - Person and social attitudes-Family and relationships-role of emotional intelligence in activating social life. Social well-being and personal growth.

5. **Methods for Personal Growth**: Meditation as a tool for personal growth-Yoga techniques for enhancing personal effectiveness and positive emotional and social life.

**Book for Study**


**REFERENCE:**


**Semester V**

**GEC5LS15 : LIFE SKILL DEVELOPMENT**

**Course No: 5.3**

**Course Code: GEC5LS15**

**Course Name: LIFE SKILL DEVELOPMENT**

**Credits: 4**

**Hours: 60**
Objectives:
1) To promote life skill education
2) To develop abilities for adaptive and positive behavior
3) To enhance self confidence and self esteem

Module 1: Introduction to Life skills
Definition – communication and action skills: verbal and vocal communication skills- body language- Mind skills, rules skill, self talk skills, explanation skills, expectation skills, time management skills, self awareness

Module 2: Presentation Skills
Planning, structuring and delivering a presentation-Effective use of language and audio visual aid— Managing Performance Anxiety, Relaxation techniques, Interviews and Group Discussions

Module 3: Relationship Skills
Introduction- Skills for Listening and Understanding, Skills for choosing and starting relationship, Skills for anger management, Coping with emotions and stress, Leadership skills.

Module 4: Critical Thinking Skills

Module IV
Compensation Management: Compensation planning – Objectives – Wage systems – Factors influencing wage system – Components of employee remuneration – Basic wage – Dearness Allowance – Bonus – Fringe benefits and incentives


Reference Books:

7. Aswathappa, K., Human Resource Management
9. Michael Porter. HRM and Human Relations
Semester V

GEC5AD16 : ADVERTISING

Course No: 5.4
Course Code: GEC5AD16
Course Name: ADVERTISING
Credits: 4
Hours: 60

BMM4C08 – Advertising

Unit 1. Definition, features, evolution and functions of advertising; kinds of advertising; agencies; economic, social and ethical issues of advertising; professional organizations and code of ethics.

Unit 2. Media planning – market analysis, product research, media reach and frequency, scheduling, segmentation, positioning, media mix and support media planning. Ad campaign.

Unit 3. Brand awareness and attitudes, brand identity, brand equity, brand image, brand loyalty and Rossiter-Percy Model.

Unit 4. Types of print radio, TV and web Ads; outdoor ads-hoardings, billboards, posters, digital displays and Pop ads; Basic elements of ads- Headlines/slogans, copy, illustrations/pictures, logo, brand names, agency signature. Advertising skills; principles, concepts and functions of advertising; types of advertising; advertising media and their effects-out door, print; radio, TV and Web; elements of advertisement – copy, slogans, illustrations, brand names, trade names, jingles; designing of ads.
Semester V

SDC5GM17 : Diamond Grading and Sorting

Course No: 5.5
Course Code: SDC5GM17
Course Name: Diamond Grading and Sorting
Credits: 3
Hours: 45

Geological occurrence of Diamonds, Diamond deposits, Kimberlites and Lamprolites, pipe deposits, Survey methods if diamond deposits, Mining techniques of diamond deposits, History of diamond and diamond mining, Blood diamonds and conflict diamonds, Kimberly process certification, 4-C’s of diamond, Cut grading of diamonds (Different shapes-RBC, Fancy cut), Symmetry of diamonds, Table, crown height, crown angle, pavilion, depth, pavilion angle, girdle thickness, culet, total depth etc., Steps included in cutting and polishing of diamonds (planning and making, sawing, bruting, faceting of cable, faceting of crown, faceting of pavilion)

Colour grading – Different colour grading system and GIA standard colour grading system, instruments used in colour grading, fluorescence and phosphorescence

Clarity- Inclusions – feather, pinpoints, crystals
blemishes or externals- natural, polishing lines

Burn marks etc.

Different standards of clarity grading and GIA standard of clarity grading

Plotting (Documentation of clarity grading of diamonds)

Carat weight, Price list of diamond and Rapaport price list, Diamond trading corporation and its functions

Steps included in cutting and polishing of diamonds - planning and marking, sawing, Bruting, Faceting of table, Faceting of crown, Faceting of pavilion

Instruments used in cutting and polishing of diamond processing

Manual method of planning and marking, Computerized or automatic method for planning marking and diamond sawing

Judging or grading of clarity of rough diamonds - Position of the inclusion, Colour of the inclusion, Size of the inclusion, Nature of the inclusion
Colour judging or grading of rough diamonds- Depth of the colour, Shade of the colour, Colour of the inclusion, position of the colour zoning, Fluorescence and phosphorescence, Markets of rough diamonds, Surface marking of rough diamonds

Origin of diamonds accordingly its surface marking, shape and habits of rough diamonds

**References:**


**Semester V**

**SDC5GM18(P) : Diamond Grading**

Course No: 5.6  
Course Code: SDC5GM18(P)  
Course Name: Diamond Grading  
Credits: 6  
Hours: 90

4-C’s of diamond

Cut grading of diamonds (Different shapes-RBC, Fancy cut)

Symmetry of diamonds
Measurement of Table facet, measurement of crown height, measurement of crown angle, measurement of pavilion depth, measurement of pavilion angle, measurement of girdle thickness, measurement of culet size, measurement of total depth etc.

Steps included in cutting and polishing of diamonds (planning and making, sawing, bruting, faceting of table, faceting of crown, faceting of pavilion)

**Colour grading** – Different colour grading system and GIA standard colour grading system, instruments used in colour grading, fluorescence and phosphorescence

**Clarity** – Inclusions – feather, pinpoints, crystals

blemishes or externals- natural, polishing lines
Burn marks etc.

Plotting (Documentation of clarity grading of diamonds)

**Carat weight**

Price list of diamond and Rapaport price list

**References:**


Semester V

SDC5GM19(P) : Advanced Computer Aided Jewel Design – Rhino

Course No: 5.7
Course Code: SDC5GM19(P)
Course Name: Advanced Computer Aided Jewel Design – Rhino
Credits: 5
Hours: 75

3D computer aided jewellery designing using Rhino software.

References:

Rhino for Jewelry- Dana Buscaglia

Guide to Graphics Software Tools - By Jim X. Chen

Inside Rhinoceros 5 - By Ron Cheng