

UNIVERSITY OF CALICUT
DIPLOMA IN GEMMOLOGY
UNDER DISTANCE EDUCATION MODE

RULES, REGULATIONS, SYLLABUS AND SCHEME OF EXAMINATION
2012 Admission onwards

1. Name of the Course : Diploma in Gemmology (DG)
2. Duration : One year
3. Eligibility : Higher Secondary or Equivalent
4. Selection process : Based on an Entrance Test
5. Number of Paper : Theory Papers : 3
Practical : 1
Placement Training : 1
6. Evaluation System : 80% external and 20% internal

Paper I : COMMUNICATION SKILLS IN ENGLISH

1. **Aim of the Course:** To improve the student's ability in listening, speaking and reading English both at the theoretical and practical levels.

2. **Objective of the Course:**

- To introduce the students to the segments and supra-segmental of sound in English.
- To enhance the basic communication skills of the students.
- To enable the students to use English with fluency and accuracy in everyday situations.
- To expose them to different varieties of English in order to help them comprehend the language.
- To enable them to read fast and help them develop the skills of critical comprehension and thinking.

3. **Course Outline**

Module 1 : Listening Skills

1. Listening: Sounds, Stress and Intonation
 - (a) Phonemic symbols: Vowels – Diphthongs – Trip thongs – Consonants.
 - (b) Stress: Syllables – Word Stress – Stress in Monosyllables – Stress in Polysyllables – Stress in words used as different parts of Speech – Stress in compound words – Stress – Sentence Stress.
 - (c) Strong forms – Weak forms – Contracted forms.
 - (d) Intonation: Falling intonation and Rising intonation.

2. Listening Skills: Barriers to listening – Academic listening – Listening to talks and descriptions – Listening to announcements – Listening to news on the radio and television – Listening to casual conversations.

Module 2 : Speaking

Word Stress and Rhythm – Weak Forms and Strong forms – Pauses and Sense Groups – Falling and Rising tones – Fluency and pace of Delivery – Problem sounds – Different Accents (British and American) – Influence of Mother Tongue.

Module 3 : Communication Skills

- (a) What is communication? - importance of the situation (formal, semi-formal, informal – spoken and written communication – essentials of effective communication – Greeting and Introducing – Making requests – Asking for permission – Giving and denying permission – Offering and accepting help – Asking for and declining help – giving instructions and directions.
- (b) Telephone Skills: Understanding Telephone conversation – Handling calls – leaving Message – making requests – Asking for and Giving permission – Giving instructions.
- (c) Discussion Skills: Giving your opinion agreeing and disagreeing – explaining, making suggestions – interrupting – questioning – reporting – detailing with questions.

Module 4 : Reading

Surveying a text book – scanning – using an index reading with a purpose – making predictions about your reading – surveying a chapter – unfamiliar words – connections between facts and ideas – locating main points – understanding text structure – making inferences – reading graphics- identifying viewpoints – reading critically – analyzing argument.

Reading List:

1. Study Listening: A Course in Listening to Lectures and Note-taking (Book with Audio CD) Tony Lynch, Cambridge University Press (2008).
2. Study Speaking: A Course in Spoken English for Academic Purposes (Book with Audio CD), Kenneth Anderson, Joan Maclean and Tony Lynch, Cambridge University Press, 2008.
3. Spoken English Part I & II, A Foundation Course for Speakers of Malayalam, Kamlesh Sadanand & Susheela Punitha, Orient Longman Pvt. Ltd. (2008).
4. Oxford Guide to Effective Writing and Speaking, John Seely, New Delhi, OUP, 2007.

Paper II : PHYSICAL, CHEMICAL AND OPTICAL PROPERTIES OF GEM STONES

Unit 1: Introduction to gemmology – Basic qualities of gem stones (hall marks), chemical composition, weights and measures. Factors that influence the value of gemstone – beauty, durability, rarity and acceptability.

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.

Unit 2: 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.

Unit 3: Optical properties – Importance of light in gemmology, the electromagnetic spectrum, the visible region. Transparency – its degree as an

observation for gem identification, cutting and grading. Laws of refraction, refractive index, reflection and its effects, refractometer, birefringence and its determination. Polarized light – Nature and production, isotropic and anisotropic behaviour, optic axes – Design and construction of polariscope use of polariscope in gemmology.

Absorption of light and colour of gem stones – allochromatism, idiochromatism, pleochroism. Dichroscope – construction and use, Interference and diffraction, play of colour, dispersion, use of the Chelsea colour filter, luminescence.

Unit 4 : Instrumental methods for gem identification: Use of 10x lens, balance, microscope, etc. Principle, instrumentation and application of spectroscope in identifying different gem stones. Use of ultraviolet lamps. Thermal and electrical conductivity and probes, reflectance meters. Brief study on the use of infrared, ultraviolet and X-ray method in gem testing.

Paper III : MINEROLOGY AND IDENTIFICATION OF GEMSTONES

Unit 1 : Natural gem stones – The Earth's structure and geological activities, the origin and occurrence of gem minerals.

Colour, chemical composition, crystal system and habit, cleavage, hardness, specific gravity, refractive index (with birefringence).

Pleochroism and luster of the following gem varieties:

Andalusite, Appatite, Axinite, Aragonite, Azurite; Bermitoite, Beryl, Calcite, Chrysoberyl, Corundum; Cassiterite, Danburite, Diamond; Diopside, Enstatite, Epidote; Feldspar group, fluorspar; Garnet group, Haematite; Howelite, Idocrase, Iolite; Jadeite, Korthersite; Kyanite, Lapis lazuli, Malachite, Nephrite; Obsidian, Odontite, Opal, Peridot, Phenakite; Prehnite, Pyrites, Quartz group; Rhodochrosite, Rhodonite, Sodalite; Sonchite, Smithsonite, Sphene, Spinel group; Spodumene, Steatite, Topaz, Tourmaline, Turquoise, Zircon and Zoisite.

Unit 2 : Gems of organic origin – Ormation, structure, recovery and identification of native, cultured and imitations perls, Amber, coral, copal, ivory, jet, tortoise shell. Artificial gem materials – methods of manufacture and identification of synthetic composite and imitation stones.

Unit 3 : Fashioning of gem stones – Description of gem stone cuts including diagrams, brilliant, step, mixed, rose, cabochon, scissors or cross.

Processes in lapidary and diamond manufacture. Valuation standards and appraisal procedures of gemstones, marketing and export procedures.

Unit 4 : Treatment of gem stones – Dyeing, bleaching, impregnation, coating, heat treatment, irradiation, laser treatment, fracture filling and diffusion treatment.

HPHT diamond treatment

Gem stettings and testing in Jewellery, trading, export, mining, lapidary activities and diamond manufacture regulations.

Practical I – Systematic identification of crystals and minerals.

Unit 1 : Study of crystal forms, habits and growth features of various gem stones.

Unit 2 : Identification of gem stones using specific gravity, R.I., dichroism, anisotropism, chelsea filter effect, spectra, luminescences, inclusions, etc.

Unit 3 : Distinguishing gem stones of the same colour form on the basis of various physical and optical properties, identification of natural, cultured and imitation pearls.

Books recommended:

1. Beginners Guide to Gemmology by P.G. Read
2. Practical Gemmologer by R. Webstar.
3. Gem Testing by S.W. Anderson
4. Gemstones of the World by W. Schumann.

SCHEME OF EXAMINATION

Sl. No.	Title	Duration (Hours)	Marks		Total
			Internal	External	
1.	Paper I : Communication Skills in English	3	20	80	100
2	Paper II : Physical, Chemical and Optical Properties of Gemstones	3	20	80	100
3	Paper III : Minerology and Identification of Gemstones	3	20	80	100
4	Practical I : Systematic identification of Crystals and Minerals	3	20	80	150
5	Placement Training Report	--	--	--	50
TOTAL MARKS					500

Question Paper Pattern for Paper II and Paper III

There shall be three sections in the question papers as given below:

Section A : 10 questions 2 marks each. (10x2 = 20)

Section B : 8 short answer type questions 6 to be answered 5 marks each (6x5 = 30)

Section C : 5 essay type questions 3 to be answered 10 marks each (3x10 = 30)

For theory papers II and III questions will be selected from a question bank prepared by experts in the field.

Question paper pattern in the case of Paper I – Communication Skills in English shall be the same as that of the B.A./B.Sc. degree courses of the University.

Pass minimum: Candidates shall be declared to have passed the course of he/she obtains not less than 40% in paper I Communication Skills in English and 60% of marks in each theory paper and 80% in practical. Candidates failing to secure the paper minimum need to reappear only for that paper.