



SYLLABUS FOR **GEM IDENTIFICATION COURSE** – Advance THREE MONTHS (3 days a week)

❖ **WEIGHTS & MEASUREMENTS:**

Carats, Rati, Tola, Gram, etc.
 Correct use of 10 X Lens.

❖ **PHYSICAL PROPERTIES WITH DEFINITIONS & Practicals**

Habit	Forms	Open & closed Forms	Surface Markings
Cleavage	Hardness	Mohs Scale of Hardness	Twinning & its types
Fracture	Crystal	Crystal system	Specific gravity, etc.

❖ **OPTICAL PROPERTY:**

Colour	Transparency its types	Luster its types
Refraction and Reflection	Single Refraction	Double Refraction
Refractive index – RI	Isotropic and Anisotropic	Uniaxial and Biaxial U/B+/-
Fluorescence	Phenomena and its types.	Inclusions & its types

❖ **CRYSTAL SYSTEMS of GEMSTONES:**

1. Cubic	-	Diamond, Spinel, Garnet, Fluorspar, Pyrite, etc.
2. Hexagonal	-	Beryl (Emerald, Aquamarine, etc.) Apatite, etc.
3. Tetragonal	-	Zircon, Scapolite, Idocrase, Rutile, etc.
4. Trigonal	-	Corundum, Quartz, Tourmaline, etc.
5. Orthorhombic	-	Topaz, Chrysoberyl, Iolite, Fibrolite, Peridot, etc.
6. Monoclinic	-	Orthoclase Feldspar, Jade, Sphene, Diopside, etc.
7. Triclinic	-	Kyanite, Turquoise, Plagioclase Feldspar, etc.

Amorphous/In-organic/Organic gem materials – Coral, Amber, Opal, Pearls, Glass, etc.

❖ **CUTS, TYPES & THEIR STYLES:**

1. Step cut	2. Brilliant cut	3. Mixed cut
4. Cabochons	5. Carvings	6. Beads, etc.

GEM SPECIES (GROUPS) THEIR VARIETIES: (Daily Practicals)

Note: Each group has different varieties varying 2 to 30 or more.

1. **Beryl:**
Emerald, Aquamarine, Heliodor, Goshenite, Green Beryl.
2. **Corundum:**
Ruby, Yellow Sapphire, Blue Sapphire, White Sapphire, Pink Sapphire, Colour changing Sapphire, Star Ruby and Star Sapphire.
3. **Chrysoberyl:**
Alexandrite, Chrysoberyl Catseye, Transparent Chrysoberyl.
4. **Spinel:**
Red Spinel, Blue Spinel, Purple Spinel.
5. **Tourmaline:**
Rubelite, Indicolite, Verdite, Dravite, Watermelon Tourmaline and Tourmaline Catseye.
6. **Topaz:**
White Topaz, Blue Topaz and Yellow Topaz.
7. **Fluorspar:**
Green, Yellow, Blue, Brown, and Parti-coloured Fluorspar.
8. **Crystalline Quartz:**
Rock Crystal, Citrine, Amethyst, Ametrine, Smokey Quartz, Rutilated Quartz.
9. **Crypto-crystalline Quartz:**

Aventurine Quartz:	-	Blue, Green, Brown.
Onyx:	-	Green, Yellow, Blue, Brown, Purple,
Agate:	-	Carnelian, Yemeni, Sulemani, Moss Agate, Scenic Agate, Banded Agate, etc.
Jasper	-	Yellow, Brown, Green, etc.
Bloodstone	-	
Tigers eye	-	
Quartz Catseye	-	
Star Quartz	-	
Rose quartz	-	
10. **Zircon:** - White, Blue, Green, Zircon Catseye.
11. **Peridot:**
12. **Turquoise:**

13. **Lapis-Lazuli:**

14. **Jade:** - **Jadeite and Nephrite.**

15. **Spodumene:** - **Kunzite and Hiddenite.**

16. **Zoisite:** - **Tanzanite**

Rare Stones:	1. Apatite	2. Andalusite	3. Diopside
	4. Enstatite	5. Epidote	6. Hematite
	7. Sillimanite	8. Iolite	9. Sphene
	10. Malachite	11. Kyanite	12. Rhodochrosite
	13. Sodalite	14. Chrysocolla	15. Gypsum
	16. Pyrite.		

Organic Gems:	1. Coral	2. Pearls	3. Amber
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Non-organic Gems:	1. Opal	2. Glass	3. Plastic
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❖ **SYNTHETIC GEMSTONES & THEIR TYPES with Practicals**

1. Verneuil or flame fusion Method	Synthetic Corundum	Synthetic Spinel
2. Flux Method.	Synthetic Emerald	
3. Hydro thermal Method.	Synthetic Emerald	Synthetic Quartz
4. Skull melt Method.	Synthetic Cubic Zirconia (CZ)	
5. Gel growth Method.	Synthetic Opal	

❖ **Treatments and Types of Treatments:**

Treatment means enhancement in which the actual body color is changed for better look. There are different methods and ways by which the color of a gemstone is changed.

Types of Treatments:

1. **Heat Treatment.**
2. **Diffusion Treatment.**
3. **Filling by various techniques**
4. **Oiling – Colourless or Coloured Oils.**
5. **Coating**
6. **Waxing**
7. **Dyeing**

Practical: Practical for mixed stones are given to every student on completion of syllabus; for identification and to get more knowledge with confidence.

Regular tests are taken for upgrading and checking the student's knowledge and to find out their weak points in learning.