

Georgia Microscopical Society
Beginner's Course in Microscopy
January 21 – March 17, 2012

Each class includes a 1/2 hour lecture with slides or visual aids and a laboratory of 1-1/2 to 2 hours – starting at 9:00 a.m. and finishing no later than 12:00 p.m. (noon). The duration of this course is 8 sessions/ 9 weeks. **ONE WEEKEND DURING THE NINE WEEKS NO CLASS WILL BE HELD. TENTATIVE SCHEDULE BELOW**

January 21 Lecture: **Introduction to Microscopy.** History of microscopy.–Types of Microscopes and their uses. The nature of light, transmission, reflection and refraction. Optics of the microscope, mirrors and lenses. Preparation of specimens for viewing: temporary and permanent mounts.

Laboratory: The use of hand lens (simple microscopy). Component parts of the compound microscope and their functions. Setting up a microscope. Viewing a specimen. Micrometry. Study of simple biological specimens: moth scales, insect parts, diatoms, pollens, feathers, etc. (prepared slides).

January 28 Lecture: **Polarized light.** The polarizing microscope. Applications of polarized light in microscopy. Contrast refractive index (indices) and Becke line. Isotropic and anisotropic (birefringent) materials.

Laboratory: Natural fiber (animal, plant and mineral fibers), glass fibers, paper-making fibers and synthetic fibers.

February 4 Lecture: **Chemical microscopy.** States of matter. Crystallization or the growing of crystals. Crystal systems. Elementary fusion methods.

Laboratory: Crystallization from solution, e.g., NaCl, $\text{NH}_4\text{H}_2\text{PO}_4$, NaNO_3 , NH_4ClO_4 , CuSO_4 . Crystallization from the melt, e.g., Thymol, TNT, DDT, cholesterol acetate. Observation and drawing of crystals under the polarizing microscope.

February 11 Lecture: **Organism Classification.** A brief history of how the 5 Kingdom system came to be, and some alternatives.

Laboratory: Using dissecting (aka stereo) microscopes, examine local representatives of the 5 Kingdoms – from bacterial colonies to strawberries to living arthropods. The kinds of organisms that live in your backyard. Feel free to bring your own.

Georgia Microscopical Society
Beginner's Course in Microscopy
January 21 – March 17, 2012
(Continued)

- February 25 Lecture: **Mineralogy & Petrology.** Rocks and minerals, their occurrence and classification. Preparation and microscopical study of thin sections.
- Laboratory: Microscopical examination of mineral grains and rock thin sections.
- March 03 Lecture: **Forensic Microscopy.** An overview on how microscopy is used to solve crimes.
- Laboratory: Microscopical examination of human and animal hair (including their own), as well as natural and synthetic fibers. Students will solve a crime using fibers during class.
- March 10 Lecture: **Electron microscopy.** Scanning electron microscopy (SEM), transmission electron microscopy (TEM) and elemental analyses.
- Laboratory: Specimen preparation and examination by SEM and TEM.
- March 17 Lecture: **Photomicrography.** Photomicrography equipment, Digital photomicrography.
- Laboratory: Students will take photomicrographs of specimens of their choice. Notebooks will be turned in for review. Awarding of certificates.