

**Georgia Microscopical Society**  
**Beginner's Course in Microscopy**  
**January 24 – March 21, 2009**

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 24 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 31 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 7 Lecture:       **Chemical microscopy.** States of matter. Crystallization or the growing of crystals. Crystal systems. Elementary fusion methods.

Laboratory: Crystallization from solution, e.g., NaCl,  $\text{NH}_4\text{H}_2\text{PO}_4$ ,  $\text{NaNO}_3$ ,  $\text{NH}_4\text{ClO}_4$ ,  $\text{CuSO}_4$ . Crystallization from the melt, e.g., Thymol, TNT, DDT, cholesterol acetate. Observation and drawing of crystals under the polarizing microscope.

February 14 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.

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**(Continued)**

- February 28    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 07      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 14      Lecture:    **Electron microscopy.** Scanning electron microscopy (SEM), transmission electron microscopy (TEM) and elemental analyses.
- Laboratory: Specimen preparation and examination by SEM and TEM.
- March 21      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.