Georgia Microscopical Society
Beginner's Course in Microscopy
January 25 – March 21, 2020

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 25 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).

February 1 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 8 Lecture: **Crystallography** States of matter. Crystallization or the growing of crystals. Crystal systems. Elementary fusion methods.

Laboratory: Crystallization from solution, e.g., NaCl, $NH_4H_2PO_4$, $NaNO_3$, 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 15 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.

February 22 Mid-Course Break (No Class Scheduled)

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(Continued)

February 29	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 7	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.** Basic concepts of photography, photography through the microscope, photomicrography equipment, digital imaging.
	Laboratory:	Students will take photomicrographs of specimens of their choice. Notebooks will be turned in for review. Awarding of certificates.