

DIRSIG “Basic” Training Course Schedule

Instructors: Scott Brown and Adam Goodenough

Day #1: Fundamentals

7:45 – 8:00 *Arrival*

8:00 – 8:30 LECTURE: Introductions and Goals (Brown)

- Course material overview, schedule discussion and the big picture
- Learn everyone’s names and what their goals are.

8:30 – 10:00 LECTURE: Capabilities Overview (Brown)

- Learn what the model can do, use cases, etc.

10:00 – 10:15 Break

10:15 – 11:00 LECTURE: Overview (Goodenough)

- Image chain driven discussion of the DIRSIG radiometry approach
- Overview of the radiometry engine architecture

11:00 – 12:00 LAB: Tutorial #1 (RGB snapshot)

- Lab exercise overview and distribution/setup of computers
- Exercise #1 is a “jump in” lab where users quickly setup a simulation using a pre-built scene and pre-built RGB framing array camera.

12:00 – 1:00 Lunch

1:00 – 2:00 LAB: Tutorial #1 (RGB snapshot)

2:00 – 3:00 LECTURE: Instrument and Platforms (Goodenough)

- Basics of modeling imaging instruments (focal planes, spectral responses, spatial responses, etc.)
- Basics of static and dynamic positioning of payloads
- Creating per-pixel truth with simulations

3:00 – 3:15 Break

3:15 – 4:00 LECTURE: Advanced Image System Modeling (Brown)

- Multi-instrument payloads
- Time driven simulations and master/slave clocking
- Platform-relative pointing, platform and sub-platform jitter
- Data-driven focal plane instruments

Day #2: Materials

7:45 – 8:00 *Arrival*

8:00 – 9:15 LECTURE: Materials (Goodenough)

- Different types of materials (surfaces, volumes, etc.)
- Different types of optical properties (DHR, BRDF, etc.)
- Radiometry solvers

10:15 – 10:30 Break

9:30 – 10:45 LECTURE: Scenes and Maps (Goodenough)

- Scene construction basics (sources of geometry, scene assembly, etc.)
- Geolocation of scenes and individual scene objects
- Overlaying classmaps on geometry to drive material assignments
- Data-driven spatial and spectral variability methods (texture)
- Map projection options
- Advanced geometry modeling (UV mapping and vertex normals)

10:45 – 12:00 LAB: Tutorial #2 (HSI Pushbroom)

- Exercise #2 teaches people how to build a new platform from scratch (in this case, a simple HSI pushbroom)
- The user also learns how to create a MODTRAN driven atmosphere, setup dynamic platform positioning and configure truth.

12:00 – 1:00 Lunch

1:00 – 1:30 LECTURE: Scene Inventory

- Overview of all available scenes, strengths and weaknesses.

1:30 – 3:00 LAB: Open Time

3:00 – 3:15 Break

3:15 – 4:00 LAB: Tutorial #4 (Scene Construction)

- Exercise #4 gets the user more familiar with how scenes are assembled and can be modified.
- The user will get a 3D model, attribute it and insert it into an existing scene.

Day #3: Scenes

7:45 – 8:00 *Arrival (Coffee)*

8:00 – 9:00 LECTURE: Atmospheric modeling (Brown)

- History of MODTRAN, strengths and weaknesses
- Using radiosonde data with MODTRAN
- Weather data and how it drives optical and thermal predictions

9:00 – 10:00 LECTURE: Installation and maintenance (Brown)

- Basics of installing and maintaining DIRSIG via myDIRSIG website
- Introduction to bug tracking system
- Documentation and demonstrations

10:00 – 10:15 Break

10:15 – 12:00 LECTURE: “Advanced Scene Construction” (Goodenough and Brown)

- A new lecture discussing a lot of “best practices” for large scene construction

12:00 – 1:00 Lunch

1:00 – 3:00 LAB: Open Time (or Bonus Labs)

3:00 – 3:15 Break

3:15 – 4:00 LAB: Open Time (or Bonus Labs)