**ASEN 4519/55519: Medicine in Space and Surface Environments**

**Field Description and Personal Equipment List**

During the simulation portion of the course, we will be creating a field camp at the Mars Desert Research Station (MDRS) outside of Hanksville, UT.

About MDRS

The Mars Desert Research Station (MDRS), owned and operated by the Mars Society, is a space analog facility in Utah that supports Earth-based research in pursuit of the technology, operations, and science required for human space exploration. We host an eight month field season for professional scientists and engineers as well as college students of all levels, in training for human operations specifically on Mars. The relative isolation of the facility allows for rigorous field studies as well as human factors research. Most crews carry out their mission under the constraints of a simulated Mars mission. Most missions are 2-3 weeks in duration, although we have supported longer missions as well. The advantage of MDRS over most facilities for simulated space missions is that the campus is surrounded by a landscape that is an actual geologic Mars analog, which offers  
opportunities for rigorous field studies as they would be conducted during an actual space mission.

* Taken from http://mdrs.marssociety.org

ASEN 4519/5519 Simulation

All analogs represent different aspects of the spaceflight environment. Similarly, our simulation will involve certain compromises to create an educational course at MDRS.

First, students will be staying in tents in a field camp created on-site. MDRS facilities will be used primarily for educational purposes. Please see below for a detailed packing list, but generally we will food, water, cookstoves, portable toilets, and all equipment necessary for the educational experience.

The environment is intended to reproduce living conditions in extreme environments, such as Mars. This means limited outside communication with Earth. There is very limited cell phone service at the site depending on carrier. Students should not expect to have any internet access, and use of electricity will be limited to operational and educational needs. This is part of the fun and challenge of the simulation.

**Food will be largely shelf stable, and cannot be tailored to fully accommodate individual diets. Participants with dietary restrictions may still participate, but please inform the instructors so we can have a discussion about your needs. We will work with you to the extent possible to ensure your needs can be accommodated.**

**Transportation**

**You are expected to provide your own transportation to the MDRS site (6-7 hour drive from Boulder) and your own transportation home. CU-Boulder and CU-Anschutz do not accept any liability while transitioning between the on-campus and field simulation portions of the course. We will provide additional details on where and when to meet in Hanksville at the beginning of the course.**

Emergency Contact Information

Please distribute the following emergency contact information to whomever you deem appropriate.

[mdrs-mission-support@marssociety.org](mailto:mdrs-mission-support@marssociety.org) is the email address for all mission activities. They monitor communications 24 hours a day, and can also access local resources in Hanksville (police, EMS, etc. as needed).

Ben Easter’s cell is 617-894-8589 and Allie Anderson’s cell is 417-388-0621. Both instructors will be on-site at MDRS for the duration of the simulation. Sometimes text messages are more likely to be delivered than phone calls, so feel free to use either means of communication.

Shannon Rupert is the Director of MDRS. Her cell is 505-927-4927 and her email is [srupert@marssociety.org](mailto:srupert@marssociety.org)

Weather

The MDRS is located in the high desert plateau country near Hanksville, Utah (elevation approximately 4300 feet). Because of the desert conditions, expect significant daily temperature variation. Weather in the area in March can be incredibly variable with highs normally in the 60s and lows at night near or below freezing.   Precipitation is unlikely (though we have had a weeks of all rain), but one should always be prepared. The wind in the desert can be strong and continuous with significant gusting. Teaching and field simulation will occur rain or shine, cold or not, windy or still.

Supplies

We have created a personal equipment list below. We reserve the right to update this list as the course approaches. If you have concerns about your ability to obtain any of these items, please let us know. Also,the closest towns to MDRS, Green River and Hanksville, are both incredibly small with no supplies available more than very basic groceries. You cannot rely on purchasing supplies there. Please obtain anything you need prior to the trip.

The key to staying comfortable in these spring time variable conditions is layers.  Lots of loose layers that fit over one another.   A synthetic or wool base layer, several layers of warmer, insulating material, and a windproof/waterproof outer layer with a hood are all essential.  Having shoes or boots that will deal with moisture and cold, as well as warm synthetic or wool socks and a warm ski-type hat, are also all important.  You will want a sleeping bag rated to 20 degrees and a good sleeping pad (not a yoga mat).

**Personal Clothing and Gear**

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| **What to Bring** | **How Much** | **Need** | **Notes** |
| Clothing | For 7 days | Required | The key to staying comfortable in these spring time variable conditions is layers.  Lots of loose layers that fit over one another.   A synthetic or wool base layer, several layers of warmer, insulating material, and a windproof/waterproof outer layer with a hood are all essential. Avoid cotton. Synthetics help wick moisture away in heat, and wool still insulates even when wet. |
| Socks | 7 pairs | Required | It’s incredibly dirty/dusty in the desert, so we recommend at least one pair of socks per day. |
| Baseball cap or brimmed hat | 1 | Optional | Great for keeping your head out of the sun when outside and not “in sim”. Not for wearing on EVA. |
| EVA Gear | see right | Required | Hiking boots – (Black or brown preferred) sturdy and already broken in. You must wear your personal boots on EVA. Be aware that they will get extremely muddy and/or dusty. Please note that these need to be BOOTs, not shoes.  Black gloves (No other color) – 2+ pairs. Inexpensive work gloves are good for cool to warm weather. Expect gloves to get very dusty and muddy.  Shirt and shorts/pants – Worn inside EVA suit to keep the suit clean and to protect you from chafing by the rough suit fabric.  Flight Suit- We will supply the flightsuit. |
| EVA Gear | See right | Optional | Stocking Cap –or “do-rag” or bandana in black or dark blue, essential to control your hair and secure sunglasses & radio mic on EVAs  Wristwatch or pendant watch to wear on the sleeve of your EVA suit or around your neck. |
| Windbreaker or winter jacket | 1 | Required | Bring a light jacket for night-time activity in the high desert in the warm season. If your mission occurs during the cold season, a winter jacket is essential. |
| Sandals or sneakers | 1 pair | Required | To be worn around camp and for class. |

**Personal Items**

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| **What to Bring** | **How Much** | **Need** | **Notes** |
| Ziploc bags and facial tissue | 1-2 boxes each | Recom-mended | Great for collecting and protecting samples as well as protecting personal gear (i.e. cameras) from dust in the field. Consider slide lock zipper bags as gloves impair manual dexterity on EVA. |
| Sleeping bag | 1 | Required | If bringing your own, we recommend a bag that is good to 20 degrees F. |
| Sleeping pad | 1 | Recommended |  |
| Tent and Tarp or Water-proof Ground Cloth |  | Required | Tents will be subject to significant wind. We highly recommend low-profile tents designed for high wind conditions. Poorly designed and high profile tents have been destroyed in the wind. If your tent is not usable, you’ll be sleeping in your car or with someone else. Also, bring lots of good tent stakes. The more the better. They will help to hold your tent down in the wind. |
| Pillow | 1 | Recom-mended | No pillows are provided; bring one if you need it for a good night’s sleep. Alternatively, stuff a pillowcase with clothing/jacket and sleep on that. |
| Head-lamp or flashlight | 1 | Required | Useful at night, for repairing stuff, on EVAs as an emergency tool… Bring spare batteries too. |
| Personal water bottle (at least 2 L capacity) | 1 | Required | Helps you remember to stay hydrated in the dry desert climate |
| Hand or body lotion, lip care (e.g. chapstick, blistex) |  | Recom-mended | The high desert is an extremely dry environment. You will be more comfortable and thus more productive if your face and hands are protected by a lotion, and your lips by a lip balm. |
| Hydrating eye/nose drops | 1 | Recom-mended | The high desert is both dry and dusty. Required if you are prone to nosebleeds or eye irritation, or if you wear contact lenses |
| Sunscreen | 1 | Required | Desert sun can be intense; the high altitude further increases its intensity. EVA suit helmets provide only partial protection. |
| Sunglasses | 1 or 2 | Recom-mended | For UV protection. |
| Personal first-aid kit |  | Optional | For small cuts, abrasions etc. |
| Personal Toiletries | As needed | Required | Baby wipes are a great solution for cleaning up in the field. |
| Reusable Eating Utensils | Spoon, Fork, Knife | Required | For meals |
| Cup and Bowl | 1 each | Required | Unbreakable metal or plastic |
| Plate | 1 | Optional | Unbreakable metal or plastic |
| Camp Chair | 1 | Required | Folding camp chair to sit in while in class and camp. Should be easily portable. |
| Camp Lighter | 1 | Required | For starting cookstoves |
| Extra Glasses or Contacts | 1 | Required if worn | Expect windy and dusty conditions |
| Small Backpack | 1 | Required | For carrying supplies on EVA |

**Personal Field Gear**

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| **What to Bring** | **How Much** | **Need** | **Notes** |
| Utility knife (like a Swiss Army knife or Leatherman combo tool) | 1 | Recommended | Very handy for repairs and field work. |
| Camera/digital camera with charger and/or extra batteries | 1 | Recom-mended | Bring the appropriate cables and thumb-drives or memory cards, spare batteries or rechargeable batteries with charger, a bag or case and if you have it, a lens care kit. |
| “Canned Air” |  | Optional | Useful for cleaning cameras and other personal equipment in the field and in the Hab. |
| Tripod, remote shutter switch | 1 | Optional | Extremely useful for field photos – the desert is windy and spacesuit gloves are awkward. |
| Notebook and writing Instrument | 1 | Required | For class notes |

**Other**

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| **What to Bring** | **How Much** | **Need** | **Notes** |
| Reading materials | As needed | Optional | Books, magazines, textbooks related to your field of work. |
| Other fun stuff | As needed | Optional | Crew members should consider bringing something they might like to do – cards, board games, a toy, a small musical instrument, ball, Frisbee, etc. |
| Food & candy | As desired | Permitted | As desired |
| Personal medications | As needed | As needed | There is no place to obtain medications in Hanksville. |

**Things not permitted at MDRS**

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| Alcoholic beverages | None | Not permitted | Not permitted in any capacity. Students in violation of this will be asked to leave. |
| Cigarettes, cigars, bongs | None | Not permitted | Smoking is not permitted at MDRS. |
| Firearms | None | Not permitted | MDRS is a firearm free campus. |