**Review Sheet for Final – Non comprehensive component** **EPSC 1370**

**Lecture – Elements and Basic Chemistry** (Powerpoint on the CEES Website; Chp 2)
Terms to Know:

| | | | |
|---|---|---|---|
| Big Bang | Quark | Atom | Electron |
| Atomic Nucleus | Atomic Mass | Element | Isotope |
| Stable Isotope | Unstable Isotope | Supernova | Nuclear Fusion |
| Atomic Number | Proton | Neutron | |

Concepts to Know:
Basic definitions
- Know what an isotope is and why they are stable and unstable

Know the structure of the universe.
Since the Big Bang what has happened to the universe in terms of temperature and size?
Know the basic history of the universe (know the four time steps).
Know how all of the elements in the universe were generated
- Big Bang
- Nuclear Fusion inside Stars
- Supernova of Larger Starts

Know the chemical symbols for the major elements in the solar system (H, He, C, N, O, Na, Mg, Al, Si, S, Cl, Fe)

**Lecture – Minerals – Physical Properties** (Lab 9 on CEES; Chp. 2)
Terms to Know:

| | | | |
|---|---|---|---|
| Luster | Prismatic | Moh's Hardness Scale | Basal |
| Hardness | Crystal Form | Cleavage | Streak Color |
| Fracture | Color | Specific Gravity | Polymorph |
| Cubic | Rhombic | Octahedral | |

Concepts to Know:
What is the complete definition of a mineral, what is the definition of a rock?
What is the complete definition of metallic and non-metallic luster?
For what type of minerals is the streak color a useful property
What is the definition of hardness?
KNOW MOHR'S HARDNESS SCALE!

How do you tell the difference between a cleavage and fracture surface?
Know about the different types of cleavage

Why do not all minerals form large crystals?
What is color not a useful property for identifying minerals?

**Lecture – Minerals - Groups** (Chp. 2)

Terms to Know:

| | | | |
|---|---|---|---|
| Silicates | Non-Silicates | Silicon-oxygen Tetrahedron | Ionic Bonding |
| Ions | Cations | Ferromagnesium Silicates | Convalent Bonding |
| Carbonates | Sulfates | Non-ferromagnesium Silicates | Halides |
| Oxides | Sulfides | Native Elements | |

Concepts to Know:

What is the complete definition of a mineral

What type of bonding is stronger? Convalent or ionic? And why?

Know the mineral names for the ferromagnesium (e.g. biotite) and non-ferromagnesium (e.g. quartz) silicates

Know an example of a mineral and its economic use for each of the non-silicate groups (e.g. native elements)

**Lecture – Rock Cycle** (Chp. 3)

Terms to Know:

| | | | |
|---|---|---|---|
| Melting | Crystallization | Weathering | Erosion |
| Deposition | Lithification | Compaction | Cementation |
| Metamorphism | | | |

Concepts to Know:

Know the materials (boxes) present in the rock cycle

Know in detail how the processes that affect materials in the rock cycle

Be able to reproduce the simple rock cycle illustrated in lecture.

Explore the different ways the rock cycle can be short-circuited

**Lecture – Igneous Rocks** (Lab 10; Chp 3)

Terms to Know:

| | | | |
|---|---|---|---|
| Magma | Lava | Extrusive | Intrusive |
| Fine-grained | Course-grained | Glassy | Pyroclastic |
| Porphyritic | Phenocrysts | Groundmass | Diorite |
| Mafic | Intermediate | Felsic | Granite |
| Andesite | Basalt | Rhyolite | Tuff |
| Gabbro | Obsidian | Eruptive Behavior | Viscosity |

Concepts to Know:

What makes up magma/lava?

How does the location in which the molten rock material influence the texture of the igneous rock?

What are the different types of textures that can be exhibited by an igneous rock?

What is the special significance of a porphyritic texture especially rocks with both small and large crystalls?

Know the classification of igneous rocks

What type of silicate minerals ferromagnesium or non-ferromagnesium are associated with mafic vs. felsic igneous rocks?
What is the significance of a glassy texture?
What are the physical properties of the different types of lava (big table)

**Lecture – Sedimentary Rocks** (Lab 10; Chp 3)
Terms to Know:

| | | | |
|---|---|---|---|
| Detrital | Chemical | Clay | Silt |
| Sand | Gravel | Lithification | Limestone |
| Chert | Gyspum | Rock Salt | Mechnical |
| Coal | Cross-Bedding | Ripple Marks | Mud Cracks |
| Fossils | Dissolution | Hydration | Hydrolysis |
| Frost Wedging | Unloading | Thermal Expansion | Biological Activity |
| Lithification | Compaction | Cementation | Sandstone |
| Shale | | | |

Concepts to Know:
What are the different types of weathering
What materials are formed by weathering that are used to make sedimentary rocks
What is the difference between a sediment and sedimentary rock?
What is the difference between a detrital and non-detrial sedimentary rock?
What are the different types of detrital sediment and what is the basis for the classification of these different sediment types?
How does a non-detrial sedimentary rock form?
What features can help you interpret the depositional environment of a sedimentary rock?

**Lecture – Metamorphic Rocks** (Lab 10; Chp 3)
Terms to Know:

| | | | |
|---|---|---|---|
| Protolith | Foliated Texture | Metamorphism | Marble |
| Slate | Phyllite | Regional Metamorphism | Quartzite |
| Metamorphic Grade | Schist | Contact Metamorphism | Gneiss |
| Non-Foliated Texture | | | |

Concepts to Know:
In general, what conditions are necessary for metamorphism to occur?
What type of texture is associated with contact metamorphic rocks?
What type of texture is associated with regional metamorphic rocks?
What are the protoliths and metamorphic grades associated with a marble, quartzite, schist, and gneiss?