**Learning objectives – GN434 Genes and Development**

Understand that Science is the study of evidence (not facts).

Understand how the evidence is gathered (limitations and bias of evidence)

Understand how evidence supports theories that make predictions.

Understand how experimental approaches can be used to test predictions of theories.

Understand that science is an evolving field that changes as new technologies and methods of analysis and evidence gathering are developed.

Understand the different scientists have very different perspectives on a given phenomenon. This can bias their interpretation of data. Alternatively, multiple ways of looking at and theorizing about a set of data can be valid. Each approach has its strengths and weaknesses.

Understand the different types of mutant alleles and the importance of the type of allele on understanding genetic relationships.

Understand the major types of signaling pathways used during development.

Become familiar with several model systems for investigation of molecular genetics in developmental biology (Drosophila, mouse, Arabidopsis).

Understand the value of using a model organism and the relevance to human biology.

Understand how a genetic screen can identify biochemical pathways that are required for a certain biological function.

Understand redundancy and pleiotropy and the implications for genetic analysis.

Understand how evolution has acted on developmental regulatory genes to alter body plan form over evolutionary time.

Be able to relate aspects of Developmental biology to medicine, agriculture and other applications.

Be able to read and discuss articles from the primary scientific literature.

Be able to create and present a presentation that reviews a body of work from the primary literature.

Understand the molecular workings of transcriptional and translational regulation and their importance for the regulation of developmental traits.

Understand approaches like traditional segregation mapping, GWAS and QTL analysis to link genotype to phenotype.

Be able to design experiments to test the predictions of a given theory or hypothesis.