

## MSGDA Program Curriculum

- Students in the MSGDA program are required to take a minimum of 65.5 credits over the course of two years of study. The coursework is comprised of required courses, elective courses, and a capstone project.
- Students are required to declare a concentration by May 1 and will begin taking electives in their 2nd year.
- Students will also complete a summer internship between years 1 and 2.

### 1<sup>st</sup> Year Fall Core Courses – 13.5 Credits

Course Number	Course Name	Credit(s)
BUS 5000	Introduction to Bioscience Industries	3.0
GENE 5120	Bioinformatics in Python	1.5
GENE 5190	MSGDA Journal Club	0.0
GENE 5200	Human Molecular Genetics	3.0
GENE 5240	Genetic Disease Mechanisms	1.5
MATH 5020	Clinical Biostatistics	3.0
MATH 5100	Data Analytics in Python	1.5

### 1<sup>st</sup> Year Spring Core Courses – 18.5 Credits

Course Number	Course Name	Credit(s)
GENE 5130	Bioinformatics in R	1.5
GENE 5150	Human Genomics NGS Lab	2.0
GENE 5191	MSGDA Journal Club	0.0
GENE 5250	Human Genomics	3.0



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GENE 5260	Clinical Cancer Genomics	3.0
GENE 5270	Medical Genetics	3.0
GENE 5280	Biochemical Genetics	1.5
MATH 5220	Data Analytics in R	1.5
REG 6520	Clinical Trial Design and Literature Evaluation	3.0

## 2<sup>nd</sup> Year Fall Core Courses – 12.0 Credits

Course Number	Course Name	Credit(s)
GENE 6130	DNA Sequencing and Variant Analysis	3.0
GENE 6140	Functional Genomics	3.0
GENE 6190	MSGDA Journal Club	0.0
GENE 6900	MSGDA Capstone Project I	6.0

## 2<sup>nd</sup> Year Spring Core Courses – 13.5 Credits

Course Number	Course Name	Credit(s)
GENE 5290	Pharmacogenomics	1.5
GENE 6135	Genomic Knowledge Translation	1.5
GENE 6145	Genomic Data Visualization and Management	3.0
GENE 6191	MSGDA Journal Club	0.0
GENE 6901	MSGDA Capstone Project II	6.0
PDEV 5220	Healthcare and Life Sciences Industry Ethics	1.5

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In addition to the above required courses, students will select 6 units of electives to satisfy their concentration requirement. Students are required to declare their concentration by May 15 of their first year and will begin taking electives in their 2<sup>nd</sup> year. Up to 3 credits may be counted from courses taken at CGU with permission of the program director.

## Clinical Decision Support

Course Number	Course Name	Credit(s)
GENE 5020	Human embryology and Prenatal Diagnosis	3.0
GENE 6446	Genetic Engineering	1.5
GENE 6447	Microbiomics and Pathogen Genomics	1.5
MATH 5120	Machine Learning in the Life Sciences	1.5
SCI 5100	Molecular Basis of Disease	1.5
SCI 5240	Medical Terminology	3.0
SCI 6410	Fundamental Papers in Applied Medicine	1.5
SCI 6700	Advanced In Vitro Diagnostics	3.0

## Clinical Trial Design

Course Number	Course Name	Credit(s)
GENE 6446	Genetic Engineering	1.5
MATH 5120	Machine Learning in the Life Sciences	1.5
REG 5000	Introduction to US Food and Drug Law	1.5
REG 6510	Clinical Trials Design, Conduct and Strategy	1.5
SCI 5300	Pharmaceutical Discovery	1.5



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SCI 5310	Pharmaceutical Development	1.5
SCI 6310	Biotechnology-Based Therapeutics	3.0
SCI 6710	Technologies for Biomarker and Drug Discovery	1.5

## Assay Development

Course Number	Course Name	Credit(s)
BUS 6600	Business Operations	3.0
GENE 6446	Genetic Engineering	1.5
GENE 6447	Microbiomics and Pathogen Genomics	1.5
MATH 5120	Machine Learning in the Life Sciences	1.5
REG 5000	Introduction to US Food and Drug Law	1.5
SCI 5000	Molecular Biotechnology	1.5
SCI 5240	Medical Terminology	3.0
SCI 5700	Medical Diagnostics	3.0
SCI 6401	Fundamental Papers in Molecular Biology and Biotechnology	1.5
SCI 6410	Fundamental Papers in Applied Medicine	1.5
SCI 6700	Advanced In Vitro Diagnostics	3.0
SCI 6710	Technologies for Biomarker and Drug Discovery	1.5

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