

2016–2017 GENETICS AND GENOMICS MAJOR**(BACHELOR OF SCIENCE ONLY)**

This program is suitable for students who plan to pursue a professional career in medicine, dentistry, veterinary medicine, medical technology, biotechnology, teaching, or do graduate work in genetics or another biological science. **Students must pass all required courses listed below with a letter grade.**

Preparatory Subject Matter (56-66 units)Chemistry (CHE): General Chemistry: 2A-B-C **Or** 2AH-BH-CH.**And** Organic Chemistry: 8A-B **Or** 118A-B-C.Mathematics (MAT): Calculus: 17A-B-C **Or** 21A-B (21C recommended).

Biological Sciences (BIS): Intro to Biology: 2A-B-C.

Physics (PHY): General Physics: 7A-B-C.

Depth Subject Matter (40-48 units). Course prerequisites in brackets; typical quarter(s) offered listed to the right.

Statistics (STA): 100 – Applied Statistics for Biological Sciences [either MAT #B] (4 units – F, W, S)
Or 130A and 130B – Mathematical Stats: Brief Course (8 units – F, W)

Biological Sciences: 101 – Genes and Gene Expression [2A-B, OChem A, STA] (4 units – F, W, S)
 102 – Structure and Function of Biomolecules [2A, OChem B] (3 units – F, W, S)
And 103 – Bioenergetics and Metabolism [102] (3 units – F, W, S)
Or
 105 – Biomolecules and Metabolism [2A-C, OChem B] (3 units – F, W, S)
 104 – Regulation of Cell Function [101; 102 or 105] (3 units – F, W, S)

Genetics and Genomics Courses:

MCB 121 – Molecular Biol of Eukaryotic Cells [101; 102 or 105 concurrently] (3 units – F, W, S)
 MCB 182 – Principles of Genomics [101] (3 units – W)

One of:

EVE 100 – Introduction to Evolution [101] (4 units – F, W, S)
Or BIS 181 – Comparative Genomics [101] (3 units – F)

One of:

MCB 164 – Advanced Eukaryotic Genetics [MCB 121] (3 units – W)
Or BIS 183 – Functional Genomics [101; 102 or 105] (3 units – S)

One of:

MCB 160L – Genetics Laboratory [101] (5 units – F, W, S)
Or BIS 180L – Genomics Laboratory [181, MCB 182, BIS 183 concurrently] (5 units – S)

Restricted Electives: **9** units of upper division courses: BIS 134, 181, 183, BIT 150, ECS 124, EVE 100, 102, 103, 131, 150, 161, 175, MIC 105, 150, 170 (EVE and MIC courses not offered every year), MCB 150, 162, 163, 164, PLB 112, 113, PLS 154. Or upper division courses in genetics or other fields relevant to the student's interest chosen in consultation with the adviser. No more than 4 units of 192, 193, 194H or 199 may be used for credit in this category.

Unrestricted Electives Must complete 180 total units, including all majors, minors, and GE courses. The College of Biological Sciences requires 64 total upper division units for graduation.

Transfer Students Transfer students who plan to enter UCD as junior in the fall quarter are strongly advised to complete organic chemistry and as many other of the freshman and sophomore courses listed above prior to starting at UCD.

Possible 4-year Study Plan

	FALL	WINTER	SPRING
Year 1	Chem. 2A or 2AH ¹ (5)	Chem. 2B or 2BH (5)	Chem. 2C or 2CH (5)
	Math 17A or 21A ² (4)	Math 17B or 21B (4)	Math 17C or 21C (4)
	G.E. / UWP 1 or Subject A (4) 13	or Biol. Sci. 2A (5) Elective (3-4) 13	Biol. Sci. 2A or 2B (5) Elective (2) 15
Year 2	Biol. Sci. 2B or 2C (5)	Biol. Sci. 2C (5)	Biol. Sci. 101 ⁴ (4)
	Chem. 8A or 118A (2-4)	Chem. 8B or 118B (4)	Biol. Sci. 101D (opt) (1)
	Statistics 100 or <u>130A</u> (4)	Physics 7A ³ or Statistics <u>130B</u> (4)	Chem. 118C (4)
	G.E. (4) 15-17	Electives (2) 15	Physics 7A or 7B (4) Electives (2) 14-15
Year 3	BIS 102 ⁴ (or BIS 105) (3)	Biol. Sci. 103 ⁴ (or BIS 105) (3)	BIS 104 ⁴ (3)
	Physics 7B or 7C (4)	(3) <u>BIS 183</u> or MCB 164 later (3)	UWP 1XX (<i>English Comp. Req.</i>) (4)
	MCB 121 (4)	Restricted Electives (4)	G.E. / Elective (4)
	Restricted Elective (3) 14	G.E. (4) [MCB 160L or MCB 121 ⁵] 14	[MCB 160L or MCB 121 ⁵] 14
Year 4	EVE 100 or <u>BIS 181</u> (3-4)	<u>MCB 182</u> (3)	[MCB 160L ⁵]/ <u>BIS 180L</u> ⁵ (4-5)
	BIS 104 / Elective (3)	<u>MCB 164</u> or BIS 183 earlier (3)	Research Units (3)
	Research Units (3)	Restricted Elective (4)	Restricted Elective (4)
	Restricted Elective / G.E. (4)	G.E. (4)	Elective (2)
	[MCB 160L ⁵] 13-14	[MCB 160L ⁵] 14	13-14

MUST HAVE 180 TOTAL UNITS & 64 UPPER DIVISION UNITS TO GRADUATE

Average workload should be 15 units per quarter to graduate in 4 years

¹ Students with a good high school chemistry and physics background, good math skills and who score satisfactorily on diagnostic examinations may choose to take the Chem. 2AH (honors) series. If they do not do well, they should continue on with Chem. 2B and 2C.

² Math. 21A requires knowledge of analytic geometry and a facility for math. Students who do poorly in Math. 21A should continue on with the Math 17 series.

³ Physics may be started in the second quarter of the freshman year if desired, in which case Biol. Sci. can be taken in the sophomore year.

⁴ Genetics majors are encouraged to start Biol. Sci. 101 in the Spring Quarter of their sophomore year and BIS 102 in the Fall or BIS 105 in Fall/Winter of Junior year (instead of BIS 102 & 103). Transfer students lacking organic chemistry may have to postpone 101 until the Winter Quarter. (Biol. Sci. 101, 102, 103 and 104 are taught all three quarters, BIS 105 is variable.)

⁵ MCB 160L may be taken immediately after completing BIS 101. It is offered all three quarters. BIS 180L must be taken after BIS 181 and MCB 182, but BIS 183 may be taken concurrently.

⁶ Underlined courses are taught only during the quarter indicated.