

Wright State University, Department of Computer Science and Engineering
Bachelor of Science Degree in Computer Science (ABET-CAC Accredited)

Model Program - Visualization Track with application areas

Biomedical Engineering (BME), Industrial and Systems Engineering (ISE), Mechanical Engineering (ME), and Bio-Informatics

Total Hours: 191^{2,3,4}-194¹

Effective Starting Spring, 2009

	Fall		Winter		Spring	
	<i>Course</i>	<i>Hours</i>	<i>Course</i>	<i>Hours</i>	<i>Course</i>	<i>Hours</i>
Freshman	CS 240 Computer Programming I	4	CS 241 Computer Programming II	4	CS 242 Computer Programming III	4
	MTH257 Discrete Mathematics	3	MTH229 Calculus I	5	MTH 230 Calculus II	5
	ENG 101 Composition I	4	ENG 102 Composition II	4	General Education	4
	General Education	<u>4</u>	General Education	<u>4</u>	CEG 233 Linux and Windows	<u>4</u>
		15		17		17
Sophomore	CS 400 Data Structures & Algorithms	4	CHM121 General Chemistry	5	CEG 320 Computer Organization	4
	MTH 231 Calculus III	5	MTH 253 Matrix Algebra	3	CS/CEG Technical Elective	4
	PHY 240 General Physics I + lab	5	PHY 242 General Physics II + lab	5	PHY 244 General Physics III + lab	5
	General Education	<u>4</u>	General Education	<u>4</u>	General Education	<u>4</u>
		18		17		17
Junior	CEG 433 Operating Systems	4	CEG 460 Software Engineering	4	Math/Sc. ^{1,3} /Gen. ⁴ /CS/CEG Tech. ² El.1 ^{1,3} -4 ^{2,4}	
	STT 363, STT 360 or ISE 301 ² (Statistics)	3	General Education	4	CS 405 Intro to Database Mgmt/CS271 ⁴	4
	CEG 476 Computer Graphics I	4	ANT 311 ¹ /ISE 431 ² /ME 212 ³ /BIO 112 ⁴	4-5	CEG 479 Computer Animation	4
	EGR 335 Technical Communication ²³	3	CEG 477 Computer Graphics II	<u>4</u>	ANT 312 ¹ /ISE 451 ² /ME 213 ³ /BIO 115 ⁴	<u>4-5</u>
	ANT 310 ¹ / ISE 406 ² / ME 102 ³ / BIO 111 ⁴	<u>3-5</u>		16-17		16-17
		15-18				
Senior	CS 466 Intro to Formal Languages	4	CS 480 Comparative Languages	4	EGR 335 ¹ /Gen. El. ² /ME 317 ³ /CS 4053 ¹⁻⁴	2,3,4
	General Education	4	CS 415 Social Implications of Comp	3	CS/CEG Techn. El. ^{1,2,4} / Gen. El. ³	1 ³ -4 ^{1,2,4}
	CS/CEG Techn. Elective ^{1,2} /CS 316 ³ / CS471 ⁴	4	BME 471 ¹ /CS 317 ³ /EGR 335 ⁴	3-4	Math/Science Elective	1
	BME 470 ¹ / ISE 407 ² / ME 315 ³ / Gen. El. ⁴	<u>4</u>	CS/CEG Technical Electives	<u>4^{1,3,4}-8²</u>	CEG 499 Scientific Vis. & Virt. Env.	<u>4</u>
		16		14-16		12-15

¹ BME; ² ISE ; ³ ME ; ⁴ Bio-Informatics ; Gen. El.=General Elective ; Techn. El.=Technical Elective ; Sc. = Science

BACHELOR of SCIENCE in COMPUTER SCIENCE (ABET-CAC Accredited)

191 Hours

Visualization Option with Application Areas

Biomedical Engineering (BME), Industrial and Systems Engineering (ISE), Mechanical Engineering (ME), and Bio-Informatics

I. COMPUTER SCIENCE AND ENGR COURSES (86 Hrs.)

A. Required Computer Science Courses (31 Hrs.)

CS 240 Computer Programming I	4	___
CS 241 Computer Programming II	4	___
CS 242 Computer Programming III	4	___
CS 400 Data Structures and Algorithms	4	___
CS 405 Intro to Data Base Man. Systems	4	___
CS 415 Soc. Implications of Computing	3	___
CS 466 Introduction to Formal Lang.	4	___
CS 480 Comparative Languages	4	___

B. Required Computer Engineering Courses (16 Hrs.)

CEG 233 Linux and Windows	4	___
CEG 320 Computer Organization	4	___
CEG 433 Operating Systems I	4	___
CEG 460 Intro. to Software Engineering	4	___

C. Required Visualization Courses (16 Hrs.)

1. CEG 476 Computer Graphics I	4	___
2. CEG 477 Computer Graphics II	4	___
3. CEG 479 Computer Animation	4	___
4. CEG 499 Scientific Visualization and Virtual Env.	4	___

D. Application Area-specific Courses (20 Hrs.)

Students must pick one of four application areas among Biomedical Engineering (BME), Industrial and Systems Engineering (ISE), Mechanical Engineering (ME), or Bio-Informatics (BioInf) and take the following area-specific courses:

ME

1. CS 316 Numerical Methods for Digital Comp. I	4	___
2. CS 317 Numerical Methods for Digital Comp. II	4	___

Select 12 additional hours from CS/CEG Technical Elective Courses.

BioInfo

1. CS 271 Introduction to Bioinformatics	4	___
2. CS 471 Algorithms for Bioinformatics	4	___

Select 12 additional hours from CS/CEG Technical Elective Courses.

BME/ISE

Select 20 additional hours from CS/CEG Technical Elective Courses.

D. Technical Communication (3 Hrs.)

EGR 335 Technical Communications	3	___
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II. GENERAL EDUCATION (40 Hrs.)

Area I- Communication and Mathematical Skills

ENG 101 - Composition I	4	___
ENG 102 - Composition II	4	___
Mathematics (see required Math/Stat section)		

Area II – Cultural-Social Foundations-8 Hrs.

History – Select 1 Course:		
CLS 150, HST 101, HST 102, HST 103		
1. _____	4	___
The Non Western World(WI) – Select 1 Course:		
CSE/CST, RSE/RST, HLT 202, SW 272, URS 200		
1. _____	4	___

Area III – Human Behavior – 8 Hrs.

Select 2 Courses From *Different* Rows:

Econ: EC200 (Some WI), EC 290 (WI)		
Political Science: PLS 200		
Psychology: PSY 105*		
Sociology (WI): SOC200, SOC205		
1. _____	4	___
2. _____	4	___

*PSY 105 required for ISE

Area IV – Human Expression – 4 Hrs.

Select one course:

Great Books (WI):		
CLS, ENG, PHL or REL 204		
Fine and Performing Arts:		
ART, MUS or TH 214, MUS 290, MP 131		
1. _____	4	___

Additional courses from Areas II, III, and IV-8 Hrs.

Select one course from two of these three areas. Except for Area II, the course selected must come from a different subcategory than the course(s) chosen to meet the area requirement. (See undergraduate catalog-Gen. Ed. Section for complete details).

1. _____	4	___
2. _____	4	___

Area VI – College Component 4 Hrs.

Select any Area VI College of Liberal Arts course.

1. _____	4	___
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III. MATHEMATICS AND SCIENCE COURSES (45 Hrs.)

A. Required Mathematics/Statistics Courses (24 Hrs.)

MTH 229 Calculus I	5	___
MTH 230 Calculus II	5	___
MTH 231 Calculus III	5	___
MTH 253 Matrix Algebra	3	___
MTH 257 Discrete Mathematics	3	___
STT 363, STT 360, or ISE 301 ¹ Statistics		

¹ ISE 301 required for ISE

B. Science and Mathematics Courses (21 Hrs.)

Laboratory Sequence:

1. PHY 240/200 General Physics I + lab	5	___
2. PHY 242/202 General Physics II + lab	5	___
3. PHY 244/204 General Physics III + lab	6	___

BME

Additional Science/Math Course(s):

CHM 121/CHM 125	5	___
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Other application areas need additional science course as listed in box.

_____	5	___
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IV. Application Area-specific Courses (20-23 Hrs.)

Depending on application area chosen in section I. (D) students must take the following courses for the same application area:

BME

1. ANT 310 Human Anatomy & Physiology I	5	___
2. ANT 311 Human Anatomy & Physiology II	5	___
3. ANT 312 Human Anatomy & Physiology III	5	___
4. BME 470 Photon Radiation	4	___
5. BME 471 Medical Imaging	4	___

ISE

1. ISE 406 Human Factors in Eng. Design	4	___
2. ISE 407 Industrial Ergonomics	4	___
3. ISE 431 Visualization and Human Perform.	4	___
4. ISE 451 Human Computer Inter. and Use.	4	___

Select 4 additional hours from General Elective Courses; electives may be from any area of study based on policy guidelines.

ME

1. ME 102 Engineering Programming w. Matlab	3	___
2. ME 212 Statics	4	___
3. ME 213 Dynamics	4	___
4. ME 315 Thermodynamics	4	___
5. ME 317 Fluid Dynamics	4	___

Select 1 additional hour from General Elective Courses; electives may be from any area of study based on policy guidelines.

BioInf

1. BIO 111 Human Biology	4	___
2. BIO 112 Cell Biology and Genetics	4	___
3. BIO 115 Biodiversity and Ecology	4	___

Select 8 additional hours from General Elective Courses; electives may be from any area of study based on policy guidelines.

General Education: Courses must be chosen to satisfy the University General Education requirements.

GENERAL ELECTIVES: Courses may be chosen from any area of study. See Policy Guidelines for exceptions.

SCIENCE COURSES: Courses must be appropriate for science or engineering majors.

CS/CEG ELECTIVES: Courses from Computer Science or Computer Engineering to provide additional breadth in the discipline. See Elective Sheet.

ALL ELECTIVE COURSES MUST BE APPROVED BY A DEPARTMENT ADVISOR.