

# NORTH CAROLINA AGRICULTURAL AND TECHNICAL STATE UNIVERSITY

## CURRICULUM

### B.S. BIOLOGICAL ENGINEERING –Bioprocess Engineering Track Fall 2019-20

FALL		SPRING	
<b>FIRST YEAR</b>			
GEEN 100 – Engineering Design and Ethics**	2	ENGL 101 – Written Communication II	3
ENGL 100 – Written Communication I	3	CHEM 107 – General Chemistry VII**	3
GEEN 111 – College of Eng. Colloquium I	1	CHEM 117 – Gen Chemistry VII Lab	1
CHEM 106 – General Chemistry VI**	3	BIOE – 121 Intro to BIOE	1
CHEM 116 – Gen Chemistry VI Lab	1	MATH 132 – Calculus II**	4
MATH 131 – Calculus I**	4	PHYS 241 – General Physics I**	3
		PHYS 251 – Gen Physics I Lab	1
<b>Total</b>	<b>14</b>	<b>Total</b>	<b>16</b>
<b>SECOND YEAR</b>			
GEEN 161 – Computer Programming in MatLab	2	BIOL 101 – Concepts of Biology	4
MEEN 230 Statics and Mechanics of Materials**	3	CHEM 221 – Organic Chemistry	3
MATH 231 – Calculus III**	4	CHEM 223 – Organic Chemistry Lab	1
PHYS 242 – General Physics II**	3	CAEE 334 – Engineering Mechanics II**	2
PHYS 252 – General Physics II Lab	1	MATH 341 – Introduction to Differential Equations**	3
BIOE 200 Biological Eng Design	1		
Humanities, Elective	3	African/American Studies, Elective	3
<b>Total</b>	<b>17</b>	<b>Total</b>	<b>16</b>
<b>THIRD YEAR</b>			
CHEN 200 – Chemical Process Principles	4	BIOL 221 – General Microbiology	4
ISEN 260 – Engineering Economy**	2	MEEN 260 Material Science	2
<i>MEEN 241 Thermodynamics</i>	3	BIOE 320 - Heat & Mass Transfer in BIOL Systems	3
BIOE 340 – Engineering Properties of Biological Materials	3	<i>BIOE 350 – Engineering Systems Analysis &amp; Design**</i>	3
CAEE 362 – Engineering Fluid Mechanics & Hydraulics**	3	Global Studies, Elective	3
<b>Total</b>	<b>15</b>	<b>Total</b>	<b>15</b>
<b>FOURTH YEAR</b>			
ECEN 340 – Electrical Circuits and Systems**	3	BIOE 423 – Fund. of Renewable Energy Systems**	3
BIOE 422 – Bioprocess Engineering	3	BIOE 425 – Instrumentation for Biological Systems	3
BIOE 434 - Ecological Engineering	3	BIOE 496 – Engineering Design II (Capstone)**	2
BIOE 495 – Engineering Design I (Capstone)**	1	<i>BIOE Elective</i>	3
Statistics Elective **	3	Social Behavioral Science, Elective **	3
<b>Total</b>	<b>13</b>	<b>Total</b>	<b>14</b>
		<b>Grand Total</b>	<b>120</b>

\*\*A grade of “C” or above is required.

BIOE Electives:

BIOE 404, BIOE 432, BIOE 422, BIOE 485, BIOE 490, CIEN 310 or other senior level courses approved by the faculty advisors.

Statistics Electives:

MATH 224, ECON 305, ISEN 370, and CAEE 304