



**2009-10 Course Requirements for BSE Degree – Courses Common to All Option Areas**

All courses in this table must be included in calculations used to check the 2.35 GPA program entrance requirement

Crds	Sem/Yr Taken	Grade	Requirement	Course Taken to Meet Requirement
			MATH 221 (5) Calculus and Analytic Geometry	
			MATH 222 (5) Calculus and Analytic Geometry	
			MATH 234 (3) Calculus—Functions of Several Variables	
			Intro Statistics for Engineers (STAT 224 (3) or 324 (3))	
			Chemistry (Chem 109 (5) or Chem 103 (4) and Chem 104 (5))	
			Comp Sci 310 (3) Problem Solving.	
			Agr. and Life Science Course (min. of 3 crds from required list)	
			Biological Sciences (min. 3 crds from required list)	
			E M A 201 (3 crds) Statics	
			Physics 202 (5) General Physics	
			Engineering Graphics Course ( M E 170 (2) or M E 231 (2))	
			Thermodynamics (M E 361 (3) or CBE 211(3))	
			Engineering Economics Course (ISYE 313 (3) or M E 314(3) or ACCT I S 300 (3) or FINANCE 300 (3))	
			BSE 249 (3) Engr. Principles for Biological Systems or CBE 250 (3)	
			BSE 364 (3) Engr. Properties of Food and Biological Materials	
			BSE 365 (3) Measurements and Instrumentation for Biol Systems	
			BSE 375 (3) Biological Concepts for Engineers	
			BSE 409 (1) Career Management for Engineers	
			BSE 509 (3) BSE Senior Design	

**2009-10 Course Requirements for BSE Degree – Machinery Systems Engineering Specialization**

All courses in this table must be included in calculations used to check the 2.35 GPA program entrance requirement

Crds	Sem/Yr Taken	Grade	Requirement	Course Taken to Meet Requirement
			BSE 475 (3) Engr Principles-of Ag Machinery	
			BSE 476 (3) Engr Principles of Off-Road Vehicles	
			EMA 202 or M E 240 (3) Dynamics	
			M E 331 (3) Geometric Modeling for Engineering Applications	
			M E 306 (3) Mechanics of Materials	
			M E 307 (1) Mechanics of Materials Lab	
			M E 313 (3) Manufacturing Processes	
			M E 340 (3) Introduction to Dynamic Systems	
			M E 342 (3) Design of Machine Elements	
			M E 363 (3) Fluid Dynamics	
			BSE Breadth Course (351(3), 356(3), 367 (3), 372 (2), 441 (3), 460 (3), 472 (3), 473 (2), 542 (3), 571 (3), or BSE 642 (2))	
			Technical Elective	
			Technical Elective	
			Technical Elective	
			Technical Elective	
			Technical Elective	
TOTAL– Minimum 44 Credits Required				

## 2009-10 Course Requirements for BSE Degree – Machinery Systems Engineering Technical Electives

The following courses can be used to meet technical elective requirements for the Machinery Systems Engineering specialization

Area	Course	Area	Course	
Mechanical Engineering	M E 364 (3) Elementary Heat Transfer	General	INTEREGR 160 (3) Intro to Engr. Design (for Freshman only)	
	M E 415 (3) Metal Forming		Up to 3 credits of BSE 001 Cooperative Education Program, BSE 299 Independent Study, BSE 399 Coordinated Internship, and/or BSE 699 Special Topics. No more than 2 credits of BSE 399 taken in a given semester can be used to meet technical elective requirements.	
	M E 417 (3) Introduction to Polymer Processing			
	M E 418 (3) Engineering Design with Polymers		Up to 6 credits of math, science, statistics or computer science courses that are designated "advanced", or engineering courses with a 300 or greater course number	
	M E 426 (3) Reliability			
	M E 428 (3) Numerical Control			
	M E 437 (3) Advanced Welding Processes and Materials Selection		Biological Systems Engineering	BSE 351 (3) Structural Design for Agricultural Facilities
	M E 443 (3) Design and Analysis of Rotating Machinery			BSE 356 (3) Sustainable Residential Construction
	M E 444 (3) Design Problems in Elasticity			BSE 367 (3) Renewable Energy Systems
	M E 446 (3) Automatic Controls			BSE 372 (2) On-Site Waste Water Treatment
	M E 447 (3) Computer Control of Machines and Processes			BSE 441 (3) Rheology of Foods & Biomaterials
	M E 448 (3) Mechanical Systems Analysis			BSE 460 (3) Biorefining: Energy & Prod. from Renewable Res.
	M E 450 (3) Design and Dynamics of Vehicles			BSE 472 (3) Sediment & Bio-Nutrient Engr. & Mgmt.
	M E 451 (3) Kinematics and Dynamics of Machine Systems			BSE 473 (2) Irrigation and Drainage System Design
	M E 452 (3) Advanced Mechanics of Machinery			BSE 542 (3) Food Engineering Operations
M E 469 (3) Internal Combustion Engines	BSE 571 (3) Small Watershed Engineering			
M E 545 (3) Fluid Power	BSE 642 (2) Food and Pharmaceutical Separations			
M E 549 (3) Product Design				
Material Science	M S & E 350 (3) Introduction to Materials Science			
Engineering Mechanics	E M A 405 (3) Practicum in Finite Elements			
	E M A 506 (3) Advanced Mechanics of Materials I			
	E M A 519 (3) Fracture Mechanics			
	E M A 545 (3) Mechanical Vibrations			

## Four Year Road Map: Machinery Systems Engineering Specialization

This Road Map is a tool to assist you and your advisor in planning your academic career. Use it along with the Curriculum Sheet for your major, your DARS report, the appropriate checklist in the back of this document, and the Timetable. Your specific program of study could, and probably will, look different. You need to customize the Road Map to fit your situation, and consult with your advisor about the best path for you.

Year 1 – Fall Semester Course	Credits
Math 221 - Calculus and Analytic Geometry	5
Chemistry 109 - Advanced General Chemistry	5
Social Science (See I.E.4)	3
EPD 155 – Basic Communication (See I.C.)	2
	15

Year 2 – Fall Semester Courses	Credits
Math 234 – Calculus - - Functions of Several Variables	3
Computer Science 310 - Problem Solving Using Computers	3
EMA 202 - Dynamics	3
M E 331 - Geometric Modeling for Engineering Applications	3
BSE 249 – Engineering Principles for Biological Systems	3
	15

Year 3– Fall Semester Courses	Credits
BSE 475 – Engineering Principles of Agricultural Machinery	3
BSE 364 – Engineering Properties of Food and Biological Materials	3
M E 363 – Fluid Dynamics	3
Statistics 224 - Introductory Statistics for Engineers	3
Ag & Life Sciences (See VI.C.)	3
	15

Year 4– Fall Semester Courses	Credits
BSE 509 – Biological Systems Engineering Senior Design	3
M E 340 - Introduction to Dynamic Systems	3
I SY E 313 Engineering Economics	3
Humanities (See I.E.3)	3
Technical Elective (See VI.D.)	3
BSE 409-Career Management for Engineers	1
	16

Year 1 – Spring Semester Courses	Credits
Math 222 - Calculus and Analytic Geometry	5
M E 231 – Introductory Engineering Graphics	2
Biological Science (See I.F.)	3
EMA 201-Statics	3
Economics Course	4
	17

Year 2 – Spring Semester Courses	Credits
M E 361 - Thermodynamics	3
M E 306/07 – Mechanics of Materials/Lab	4
BSE 375 Biological Concepts for Engineers	3
Physics 202 – General Physics	5
	15

Year 3 – Spring Semester Courses	Credits
BSE 476 – Engineering Principles of Off-Road Vehicles	3
BSE 365 – Measurements and Inst. for Biological Systems	3
M E 313 - Manufacturing Processes	3
EPD 397 – Technical Communications (See I.C.)	3
Ethnic Studies/International (See I.E. 2 & I.H.)	3
Technical Elective (see VI.D)	3
	18

Year 4 – Spring Semester Courses	Credits
Breadth Requirement (See VI.D.)	3
Technical Elective (See VI.D.)	3
Humanities (See I.E. 3)	3
Technical Elective (See VI.D.)	3
Technical Elective (See VI.D.)	3
Technical Elective (See VI.D.)	2
	17

**Notes:** Need 128 credits to complete degree. If Chemistry 103 & 104 is taken in place of Chemistry 109, it is suggested to take Chemistry 103 in Fall semester and Chemistry 104 in Spring semester of year 1.