DEPARTMENT OF STATISTICS AND ACTUARIAL SCIENCE
UNIVERSITY OF GHANA
UNDERGRADUATE STUDENTS' HANDBOOK

SINGLE MAJOR IN STATISTICS

ENTRY REQUIREMENT: *STAT 111, STAT 112, MATH 121MATH 122, MATH 126*

LEVEL 200

FIRST SEMESTER			
Course Code	***Course Title***	***Credits***	***Pre-requisite(s)***
UGRC210/ UGRC 220	Academic Writing II/ Introduction to African Studies	3	
STAT 221	Introductory Probability I	3	MATH121,122, 126
STAT 223	Elementary Statistical Methods	3	
MATH 223	Calculus II	3	MATH 122
*STAT 240	Introduction to Statistical Computing	3	
Total		**15**	
Electives (3-6 Credits)			
ACTU 203	Introduction to Financial Mathematics I	3	
*STAT 220	Introduction to Actuarial Science	1	
*STAT 230	Data Mining	3	
Total Credits			**18-21**
SECOND SEMESTER			
Course Code	***Course Title***	***Credits***	***Pre-requisite(s)***
CBAS 210/ UGRC 220	Academic Writing II/ Introduction to African Studies	3	
STAT 222	Introduction to Regression and Time Series Analysis	2	
STAT 224	Introductory Probability II	3	STAT 221
STAT 226	Official Statistics	2	
		10	
Electives (6-9 Credits)			
ACTU 204	Introduction to Financial Mathematics II	3	ACTU 203
*STAT 220	Introduction to Actuarial Sciences	1	
MATH 224	Introduction to Abstract Algebra	3	**MATH 126**
STAT 228	Introduction to Non-Parametric Statistics	3	**STAT 223**
DCIT 204	Data Structures and Algorithm I	3	
*STAT 230	Data Mining	3	**STAT 121, 122**
Total Credit			**16-19**

*STAT 220, STAT 230 and STAT 240 could be taken in the first semester or the second semester.

LEVEL 300

FIRST SEMESTER			
Course Code	***Course Title***	***Credits***	***Pre-requisite(s)***
STAT 331	Probability Distributions	3	STAT 221, 224
STAT 333	Statistical Inference I	3	STAT 224
STAT 335	Sampling Survey Methods	3	
MATH351/STAT 339	Linear Algebra/Methods of Linear Algebra	3	MATH 224/ MATH 126
Total		**12**	
Electives (Select 6-9 Credits)			
ACTU 301	Life Contingency I	3	**ACTU 204**
STAT 337	Introduction to Operations Research	3	
MATH 353	Analysis I	3	**MATH 223**
MATH 355	Calculus of Several Variables	3	
MATH 359	Discrete Mathematics	3	**MATH 224**
Total Credit			**18-21**
SECOND SEMESTER			
Course Code	***Course Title***	***Credits***	***Pre-requisite(s)***
STAT 332	Multivariate Distributions	3	STAT 331
STAT 334	Statistical Inference II	3	STAT 333
STAT 336	Design of Experiments	3	STAT 223
MATH 350	Differential Equations I	3	MATH 122, 223
Total		**12**	
Electives (Select 6-9 Credits)			
DCIT 308	Data Structures and Algorithm II	3	**DCIT 204**
ACTU 332	Life Contingency II	3	**ACTU 301**
STAT 338	Decision Theory	3	
MATH 356	Analysis II	3	**MATH 223**
Total Credit			**18-21**

LEVEL 400

FIRST SEMESTER			
Course Code	***Course Title***	***Credits***	***Pre-requisite(s)***
STAT 443	Theory of Sampling	3	STAT 335
STAT 445	Advanced Regression Analysis	3	STAT 334

STAT 450	Project	3	
STAT 461	Bayesian Statistics	3	STAT 224
Total		**12**	
Electives (Select 6-9 Credits)			
STAT 440	Business Statistics	3	STAT 222,203
STAT 447	Non –Parametric Statistics	3	STAT 228
STAT 451	Random Processes	3	STAT 331
STAT 453	Population Statistics	3	
STAT 459	Statistical Quality Control	3	
STAT 455	Actuarial Statistics I	3	STAT 331
STAT 457	Economic and Social Statistics I	3	STAT 226
MATH 441	Advanced Calculus	3	MATH 353
MATH 445	Introductory Functional Analysis	3	MATH 356
Total credits			**18-21**
SECOND SEMESTER			
Course Code	***Course Title***	***Credits***	***Pre-requisite(s)***
STAT 444	Survey Organisation and Management	3	STAT 335
STAT 466	Discrete Data Analysis	3	
STAT 450	Project	3	
Total		**9**	
Electives(Select 9-12 Credits)			
STAT 442	Applied Times Series Analysis	3	
MATH 422	Integration Theory and Measure	3	MATH 356
STAT 446	Multivariate Methods	3	STAT 332
STAT 448	Analysis of Experimental Design	3	STAT 335
MATH 450	Differential Equation II	3	**MATH 350**
STAT 464	Statistical Computing with R	3	STAT 240
STAT 454	Biometrics	3	STAT 331
STAT 456	Actuarial Statistics II	3	STAT 455, 453
STAT 458	Economic and Social Statistics II	3	STAT 457
STAT 462	Biostatistics	3	
Total Credit			**18-21**

MAJOR- MINOR IN STATISTICS
LEVEL 200

FIRST SEMESTER			
Course Code	***Course Title***	***Credits***	***Pre-requisite(s)***
*CBAS 210/ UGRC 220	Academic Writing II/Introduction to African Studies	3	
STAT 221	Introductory Probability I	3	MATH 121, STAT 122
STAT 223	Elementary Statistical Methods	3	
STAT 230	Data Mining	3	STAT 121, 122
MATH 223	Calculus II	3	MATH 121
Total		**15**	
Total Credit	Take 6 credit from the Minor Department		**18 -21**
SECOND SEMESTER			
Course Code	***Course Title***	***Credits***	***Pre-requisite(s)***
UGRC210/ UGRC 220	Academic Writing II/ Introduction to African Studies	3	
STAT 222	Introduction to Regression and Time Series Analysis	2	
STAT 224	Introductory Probability II	3	STAT 221
STAT 226	Official Statistics	2	
STAT 230	Data Mining	3	STAT 121, 122
Total		**13**	
Electives(0-4 Credits)			
STAT 220	Introduction to Actuarial Science	1	
STAT 228	Introduction to Non-Parametric Statistics	3	STAT 223
STAT 240	Statistical Computing	3	
MATH 224	Introduction to Abstract Algebra	3	**MATH 126**
Total Credit	Take 6 credit from the Minor Department		**19-20**

*STAT 220, STAT 230 and STAT 240 could be taken in the first semester or the second semester.

LEVEL 300

FIRST SEMESTER			
Course Code	***Course Title***	***Credits***	***Pre-requisite(s)***
STAT 331	Probability Distributions	3	STAT 221, 224
STAT 333	Statistical Inference I	3	STAT 224
STAT 335	Sample Survey Methods	3	
MATH351/ STAT339	Linear Algebra/Methods of Linear Algebra	3	**MATH 224/ MATH 126**
Total		**12**	
Total Credit	Take 6 credit from the Minor Department		**15-18**
Students minor in Mathematics must take MATH 351 and any other Core Mathematics Course.			
SECOND SEMESTER			
Course Code	***Course Title***	***Credits***	***Pre-requisite(s)***
STAT 332	Multivariate Distributions	3	STAT 331
STAT 334	Statistical Inference II	3	STAT 333
STAT 336	Design of Experiments	3	STAT 223
Total		**9**	
	Elective(3-6 Credits)		
ACTU 302	Introduction to Actuarial Computing	3	
STAT 338	Decision Theory	3	
Total Credits			**18-21**

LEVEL 400

FIRST SEMESTER			
Course Code	***Course Title***	***Credits***	***Pre-requisite(s)***
STAT 443	Theory of Sampling	3	**STAT 335**
STAT 461	Bayesian Statistics Methods	3	**STAT 224**
STAT 445	Advanced Regression Analysis	3	**STAT 334**
STAT 450	Project	3	
Total		**12**	
Electives(Select 6-9 Credits)			
STAT 440	Business Statistics	3	STAT 222,203
STAT 447	Non–Parametric Statistics	3	
STAT 451	Random Processes	3	STAT 331
STAT 453	Population Statistics	3	STAT 453

STAT 455	Actuarial Statistics I	3	STAT 331
STAT 457	Economic and Social Statistics I	3	STAT 226
STAT 459	Statistical Quality Control	3	
Total credit			**18-21**
	SECOND SEMESTER		
Course Code	***Course Title***	***Credits***	***Pre-requisite(s)***
STAT 444	Survey Organization and Management	3	
STAT 466	Discrete Data Analysis	3	
STAT 450	Project	3	
Total		**9**	
	Electives (Select 9-12 Credits)		
STAT 442	Applied Time Series Analysis	3	
MATH 422	Integration Theory and Measure	3	MATH 356
STAT 446	Multivariate Methods	3	STAT 332
STAT 448	Analysis of Experimental Design	3	
MATH 450	Differential Equation II	3	
STAT 454	Biometrics	3	STAT 331
STAT 456	Actuarial Statistics II	3	STAT 455, 453
STAT 458	Economic and Social Statistics II	3	STAT 447
STAT 462	Biostatistics	3	
STAT 464	Statistical Computing with R	3	STAT 240
Total credit			**18-21**

COMBINED MAJOR IN STATISTICS
LEVEL 200

FIRST SEMESTER			
Course Code	***Course Title***	***Credits***	***Pre-requisite(s)***
UGRC210/ UGRC 220	Academic Writing II/ Introduction to African Studies	3	
STAT 221	Introductory Probability I	3	MATH 121, MATH 122
STAT 223	Elementary Statistical Methods	3	
MATH 223	Calculus II	3	MATH 121
**STAT 230	Data Mining	3	
Total		**15**	
Total credit			**21**
**** STAT 230 is compulsory for students combining with Mathematics** **Note: Non-mathematics combinations are not required to take STAT 230**			
SECOND SEMESTER			
Course Code	***Course Title***	***Credits***	***Pre-requisite(s)***
UGRC210/ UGRC 220	Academic Writing II/ Introduction to African Studies	3	
STAT 222	Introduction to Regression and Time series	2	
STAT 224	Introductory Probability II	3	STAT 221, MATH 223
STAT 226	Official Statistics	2	
Total		**10**	
Total Credit			**19**

LEVEL 300

FIRST SEMESTER			
Course Code	***Course Title***	***Credits***	***Pre-requisite(s)***
STAT 331	Probability Distributions	3	STAT 221, 204
STAT 333	Statistical Inference I	3	STAT 224
STAT 335	Sample Survey Methods	3	
MATH351/STAT339	Linear Algebra/Methods of Linear Algebra	3	**MATH 224/ MATH 126**
Total		**12**	
Total credit			**18-21**
Note: STAT 339 for Non-Mathematics Combinations			
SECOND SEMESTER			

Course Code	*Course Title*	*Credits*	*Pre-requisite(s)*
STAT 332	Multivariate Distributions	3	STAT 331
STAT 334	Statistical Inference II	3	STAT 333
STAT 336	Design of Experiments	3	STAT 223
Total		**9**	
	Elective (Select 0-3 Credit)		
ACTU 302	Introduction to Actuarial Computing	3	
STAT 338	Decision Theory	3	
Total credit			**18-21**

LEVEL 400

FIRST SEMESTER			
Core Courses			
Course Code	***Course Title***	***Credits***	***Pre-requisite(s)***
STAT 443	Theory of Sampling	3	STAT 335
STAT 445	Advanced Regression Analysis	3	STAT 334
Total		**6**	
Electives (Select 3-6 Credits)			
STAT 440	Business Statistics	3	STAT 222,203
STAT 447	Non-Parametric Statistics	3	STAT 333, 304
STAT 450	Project	3	
STAT 451	Random Processes	3	STAT 331
STAT 453	Population Statistics	3	
STAT 455	Actuarial Statistics I	3	STAT 331
STAT 457	Economic and Social Statistics I	3	STAT 226
STAT 459	Statistical Quality Control	3	STAT 459
STAT 461	Bayesian Statistics Methods	3	STAT 224
Total credit			**18-21**
SECOND SEMESTER			
Course Code	***Course Title***	***Credits***	***Pre-requisite(s)***
STAT 444	Survey Organization and Management	3	STAT 335
Total		**3**	
Electives(Select 6-9 Credits)			
STAT 446	Multivariate Methods	3	STAT 332
STAT 448	Analysis of Experimental design	3	STAT336
STAT 450	Project	3	
STAT 454	Biometrics	3	**STAT 331**
STAT 456	Actuarial Statistics II	3	STAT 455, 453
STAT 458	Economic and Social Statistics II	3	STAT 447
STAT 464	Statistical Computing with R	3	STAT 222, 233
STAT 466	Discrete Data Analysis	3	
Total Credit			**18-21**

MINOR IN STATISTICS
LEVEL 200

FIRST SEMESTER			
Course Code	***Course Title***	***Credits***	***Pre-requisite(s)***
*UGRC 210/ UGRC 220	Academic Writing II/ Introduction to African Studies	3	
STAT 221	Introductory Probability I	3	MATH 121, 122
STAT 223	Elementary Statistical Methods	3	
Total		**9**	
SECOND SEMESTER			
Course Code	***Course Title***	***Credits***	***Pre-requisite(s)***
*UGRC 210/ UGRC 220	Academic Writing II/ Introduction to African Studies	3	
STAT 222	Introduction to Regression and Time Series Analysis	2	
STAT 224	Introductory Probability II	3	**STAT 221**
STAT 226	Official Statistics	2	
Total		**10**	

LEVEL 300

FIRST SEMESTER			
Course Code	***Course Title***	***Credits***	***Pre-requisite(s)***
STAT 333	Statistical Inference I	3	**STAT 224**
STAT331/ STAT 335	Probability Distribution Sample Survey Methods	3	
Total		**6**	
Electives(0-3 Credits)			
STAT 337	Introduction to Operation Research	3	
SECOND SEMESTER			
Course Code	***Course Title***	***Credits***	***Pre-requisite(s)***
STAT 334	Statistical Inference II	3	**STAT 333**
STAT 332/ STAT 336	Multivariate Distributions Design of Experiments	3	**STAT 223**
Total		**6**	
Elective(0-3 Credits)			
ACTU 302	Introduction to Actuarial Computing	3	
STAT 338	Decision Theory	3	
Total		**6**	

BSC. IN ACTUARIAL SCIENCE

MAJOR IN ACTUARIAL SCIENCE

LEVEL 200 (ENTRY REQUIREMENT*: MATH 121, MATH 126, STAT 111, STAT 112, ECONS 101, ECONS 102, and MATH 122*)

First Semester

Course Code	*Course Title*	*Credits*	*Pre-requisite(s)*
Core			
UGRC 210	Academic Writing II	3	
STAT 201	Introductory Probability I	3	MATH 121, STAT 122
ACTU 203	Introduction to Financial Mathematics I	3	
MATH 223	Calculus II	3	
STAT 223	Elementary Statistical Methods	3	
Total		**15**	
Electives (Select 3 – 6 Credits)			
*STAT 240	Introduction Statistical Computing	3	
ECON 201	Elements of Economics I	3	
STAT 220	Introduction to Actuarial Science	1	
MATH 225	Vector Mechanics	3	MATH 122
Total credit			**18-21**

Second Semester

Course Code	*Course Title*	*Credits*	*Pre-requisite(s)*
Core			
UGRC 220	Introduction to African Studies	3	
ACTU 204	Introduction to Financial Mathematics II	3	
STAT 224	Introductory Probability II	3	STAT 221
MATH 224	Introductory Abstract Algebra	3	
MATH 220	Introductory Computational Mathematics	3	MATH 122
Total		15	
Electives (Select 3 – 6 Credits)			
ECON 202	Elements of Economics II	3	
DCIT 204	Data Structures and Algorithm I	3	
STAT 222	Introduction to Regression and Times Series Analysis	2	

STAT 230	Data Mining	3	
Total credit			**17-21**

LEVEL 300

First Semester

Course Code	*Course Title*	*Credits*	*Pre-requisite(s)*
Core			
STAT 331	Probability Distributions	3	STAT 224
MATH 351/ STAT 339	Linear Algebra/Methods of Linear Algebra	3	MATH 224/ MATH 126
ACTU 301	Life Contingencies I	3	ACTU 204
FINC 301	Introduction to Business Finance	3	
MATH 355	Calculus of Several Variables	3	MATH 223
STAT 333	Statistical Inference I	3	
Total		**18**	
Electives (Select 0-3 Credits)			
MATH 359	Discrete Mathematics	3	
STAT 335	Sample Survey Methods	3	
MATH 353	Analysis I	3	MATH 223
ACTU 320	Internship in Actuarial Science (either 1st or 2nd Semester) **	1	
ACTU 335	Microeconomic Theory for Actuaries I	3	
ACTU 359	Risk Management and Insurance	3	
Total credit			**18-21**

**** To be taken during vacation**

Second Semester

Course Code	*Course Title*	*Credits*	*Pre-requisite(s)*
Core			
STAT 332	Multivariate Distributions	3	STAT 331, MATH 331
ACTU 304	Life Contingencies II	3	
MATH 350	Differential Equations I*	3	MATH 223
ACTU 302	Introduction to Actuarial Computing	3	
STAT 334	Statistical Inference II	3	STAT 333
Total		**15**	
Electives (Select 3 – 6 Credit)			
CSCD 314	Operations Research	3	
MATH 354	Abstract Algebra I**	3	MATH 224
MATH 356	Analysis II	3	MATH 223
MATH 358	Computational Mathematics I	3	

ACTU 334	Microeconomic Theory for Actuaries II	3	
FINC 352	Principles and Practice of Insurance	3	
STAT 338	Decision Theory	3	
STAT 356	Life Insurance and Retirement Security	3	
Total credit			**18-21**

LEVEL 400

First Semester

Course Code	***Course Title***	***Credits***	***Pre-requisite(s)***
Core			
ACTU 410	Project	3	
ACTU 405	Fundamentals of Financial Accounting I	3	
ACTU 409	Loss Distributions & Actuarial Risk Measures	3	
ACTU 453	Introduction to Non-Life Insurance Mathematics I	3	
ACTU 407	Financial Economics I	3	
Total		**15**	
Electives (Select 3 – 6 credits)			
STAT 457	Economic and Social Statistics I	3	
STAT 445	Advanced Regression Analysis	3	STAT 334, MATH 335
ACTU 445	Macroeconomic Theory for Actuaries I	3	
STAT 443	Population Statistics	3	
STAT 451	Random Processes	3	STAT 331
MATH 441	Advanced Calculus	3	MATH 351 or MATH 353
MATH 445	Introductory Functional Analysis	3	MATH 356
ACTU 441	Econometrics for Actuaries I	3	
MATH 447	Complex Analysis	3	MATH 223
STAT 459	Statistical Quality Control	3	
STAT 440	Business Statistics	3	
Total credit			**18-21**

Second Semester

Course Code	***Course Title***	***Credits***	***Pre-requisite(s)***
Core			
ACTU 410	Project	3	
ACTU 412	Fundamental Financial Accounting II	3	
ACTU 454	Introduction to Non-life Insurance Mathematics II	3	
ACTU 408	Financial Economics II	3	ACTU204, STAT 331,STAT332
ACTU 404	Pensions and Social Security	3	
Total		**15**	
Electives (Select 3 – 6 Credits)			
MATH 442	Differential Equation II	3	

ACTU 448	Macroeconomic Theory for Actuaries II	3	
STAT 442	Applied Time Series Analysis		
FINC 458	Health Insurance	3	
STAT 458	Economic and Social Statistics II	3	
ACTU 442	Econometrics for Actuaries II	3	
FINC 452	Property and Pecuniary Insurance	3	
Total credit			**18-21**

COMBINED MAJOR IN ACTUARIAL SCIENCE

BSc/BA. ACTUARIAL SCIENCE AND MATHEMATICS
LEVEL 200(ENTRY REQUIREMENT*: MATH 121, MATH 126, STAT 111, STAT 112, MATH 12*2)

First Semester

Course Code	*Course Title*	*Credits*	*Pre-requisite(s)*
Core			
UGRC 210	Academic Writing II	3	
STAT 221	Introductory Probability I	3	MATH
ACTU 203	Introduction to Financial Mathematics I	3	
MATH 223	Calculus II	3	
Total		**12**	
Electives (Select 0- 3 Credits)			
STAT 223	Elementary Statistical Methods	3	
STAT 240	Introduction Statistical Computing	3	
ECON 201	Elements of Economics I	3	
Total credit			**18-21**

Second Semester

Course Code	*Course Title*	*Credits*	*Pre-requisite(s)*
Core			
UGRC 220	Introduction to African Studies	3	
ACTU 204	Introduction to Financial Mathematics II	3	ACTU 203
STAT 224	Introductory Probability II	3	STAT 221
MATH 224	Introductory Abstract Algebra	3	
MATH 220	Introductory Computational Mathematics	3	MATH 122
Total		**15**	
Electives (Select 3 Credits)			
ECON 202	Elements of Economics II	3	
DCIT 204	Data Structures and Algorithm I	3	
STAT 222	Introduction to Regression and Time Series	2	

STAT 230	Data Mining	3	
Total credit			**21**

LEVEL 300
First Semester

Course Code	*Course Title*	*Credits*	*Pre-requisite(s)*
Core			
STAT 331	Probability Distributions	3	STAT 221, 224
MATH 351	Linear Algebra	3	MATH 224
ACTU 301	Life Contingencies I	3	ACTU 204
FINC 301	Introduction to Business Finance	3	
MATH 355	Calculus of Several Variables	3	MATH 223
MATH 353	Analysis I	3	
STAT 333	Statistical Inference I	3	STAT 223
Total		**21**	

Second Semester

Course Code	*Course Title*	*Credits*	*Pre-requisite(s)*
Core			
STAT 332	Multivariate Distributions	3	STAT 331, MATH 331
ACTU 304	Life Contingencies II	3	
MATH 350	Differential Equations I*	3	MATH 223
ACTU 302	Introduction to Actuarial Computing	3	
MATH 356	Analysis II	3	MATH 223
STAT 334	Statistical Inference II	3	
Total		**18**	
Electives (Select 3 Credit)			
MATH 354	Abstract Algebra I	3	
MATH 358	Computational Mathematics I	3	MATH 220
Total credit			**21**

LEVEL 400
First Semester

Course Code	*Course Title*	*Credits*	*Pre-requisite(s)*
Core			
ACTU 403	Introduction to Non-Life Insurance Mathematics I	3	
ACTU 405	Fundamentals of Financial Accounting I	3	
ACTU 407	Financial Economics I	3	
ACTU 409	Loss Distributions & Actuarial Risk Measures	3	
MATH 441	Advanced Calculus	3	
Total		**15**	

Electives (Select 6 credits)			
MATH 445	Introductory Functional Analysis	3	
MATH 447	Complex Analysis	3	
Total credit			**21**

Second Semester

Course Code	*Course Title*	*Credits*	*Pre-requisite(s)*
Core			
ACTU 404	Pensions and Social Security	3	
ACTU 412	Fundamental Financial Accounting II	3	
MATH 442	Integration and Measure Theory	3	MATH 356
ACTU 444	Introduction Non-life Insurance Mathematics II	3	ACTU 443
Total		**12**	
Electives (Select 6-9 Credits)			
MATH 450	Differential Equation II	3	MATH 350
MATH 460	Fourier Series	3	
MATH 446	Module Theory	3	
MATH 440	Abstract Algebra II	3	
MATH 458	Mathematical Biology	3	
MATH 444	Calculus on Manifolds	3	
MATH 448	Special Relativity	3	
STAT 442	Applied Time Series Analysis	3	
STAT 446	Multivariate Methods	3	
Total credit			**18-21**