MINOR AREA REQUIREMENTS

SAMPLE LANGUAGE, FROM BIOMEDICAL ENGINEERING

The Graduate College requires all Ph.D. students to complete a "minor" program of study. Ph.D. candidates in other disciplines may select a minor in Biomedical Engineering. Effective Fall 2008, the Doctoral minor is 12 units: 9 units of approved BME core courses (BME 510, 511, 516, 517, 561, 566, 586), and 3 units of either Research methods in Biomedical Engineering (lab rotations) or BME Independent Study.

- Life science majors are not required to take 510/511, but will take 9 units of 516, 517, 561, 566, and 586 plus three units of independent study or rotation units.
- Engineering and Imaging majors will take BME 510 and 511, plus one of 516, 517, 561, 566, 586, plus three units of independent study or rotation units.

Completion of these courses with a "B" average for the required units is necessary for granting of the minor. BME does not require representation at the written Comprehensive Examination, but does require a BME GIDP faculty member to be present at the oral examination, and BME-related material must be covered. The student's dissertation (Doctoral final oral examination) committee must contain one faculty BME GIDP member. This committee member must be present at the dissertation defense, either in person or by teleconference. The BME Program should receive a copy of the student's Doctoral Plan of Study at the time they declare their minor in BME. The student's non-BME major advisor (mentor) cannot serve as the student's advisor for a BME minor.

A BME Doctoral student may choose to major and minor in Biomedical Engineering. The minor consists of 12 units of formal graded course work in any area of Biomedical Engineering (excluding major course work, seminars, and lab rotations).

SAMPLE FROM STATISTICS

The PhD Minor in Statistics

The following guidelines identify the basic structure of the PhD Minor in Statistics at the University of Arizona. At the core of the program is a foundation in the theory of statistical inference (via STAT 566/MATH 566); however, extensive flexibility via course electives allows students to tailor their Minor programs of study to their own interdisciplinary interests. Students may design or select a concomitant curriculum pertinent to their own research or professional interests from a list of advanced, statistically-rigorous courses taken from across the campus. Depending on the student's selection of Elective Courses, expertise may be gained in statistical practice, theory, and/or applications in a specialized area such as biometry, bioinformatics, econometrics, environmetrics, psychometrics, etc. Of course, these outcomes will differ depending on the combination of elective courses selected.

The student's minor advisor (who must be a member of the Statistics GIDP faculty – see Appendix 1), along with the GIDP Chair, should be consulted to plan the individual selection of Elective Courses. *It is GIDP policy that the student holds final responsibility for being aware of and responding to all GIDP and Graduate College policies,*

requirements, formats, and deadlines as they pertain to progression towards and completion of her/his graduate degree.

Coursework

A minimum of 12 units of coursework (graded B or better) is required for the minor. (Options are listed below) Please note, students who do not receive a B or better grade for their minor coursework may instead have an overall 3.0 GPA for minor coursework & pass the qualifying exam, theory version, at the MS level.

1. *Core Statistical Theory Course; 3 units as follows:*
   STAT 566/MATH 566 – Theory of Statistics

2. *Additional Elective Courses; minimum 9 units from any of the following*:
   ANS 513/GENE 513 – Statistical Genetics for Quantitative Measures
   AREC 517/ECON 517 – Introductory Mathematical Statistics for Economists
   CPH 576C/EPID 576C – Applied Biostatistics Analysis
   CPH 576D/EPID 576D – Data Management and the SAS Programming Language
   CPH 647/EPID 647 – Analysis of Categorical Data, *or*
      STAT 574C/SOC 574C – Categorical Data Analysis
   CPH 648/EPID 648 – Analysis of High Dimensional Data
   CPH 684/EPID 684 – General Linear and Mixed Effects Models, *or*
      FSHD 617C – Advanced Data Analysis: Multilevel Modeling
   CPH 685 – Fundamentals in Statistical Genetics and Genomics
   CPH 686/EPID 686 – Survival Analysis
   CPH 696S/EPID 696S – Biostatistics Seminar
   ECOL 518 – Spatio-Temporal Ecology
   ECON 518/AREC 518 – Introduction to Econometrics
   ECON 520 – Theory of Quantitative Methods in Economics, *or*
      SIE 530 – Engineering Statistics
   ECON 522A – Econometrics, *or*
      AREC 559 – Advanced Applied Econometrics
   ECON 522B – Econometrics
   ECON 549/AREC 549 – Applied Econometric Analysis
   EDP 658B – Theory of Measurement
   FSHD 617A – Advanced Data Analysis: Structural Equation Modeling
   FSHD 617B – Advanced Data Analysis: Dyadic Data Analysis
   GEOG 579/STAT 579/ECON 579 – Spatial Statistics and Spatial Econometrics
   LAW 611C – Litigating with Experts/ECON 538 – Law and Economics
   MATH 529 (temporary course ID) – Multivariate
   MATH 563/STAT 563 – Probability Theory
   MATH 574M– Statistical Machine Learning
   MCB 516A/ABE 516A – Statistical Bioinformatics and Genomic Analysis
   PL S 565 – Practical Skills for Next Generation Sequencing Data Analysis
   PSY 507C – Research Design & Analysis of Variance
   SIE 522 – Engineering Decision Making Under Uncertainty
   STAT 564/MATH 564 – Theory of Probability
   STAT 567A/MATH 567A – Theoretical Statistics I
   STAT 567B/MATH 567B – Theoretical Statistics II
   STAT 571A/MATH 571A – Advanced Statistical Regression Analysis
   STAT 571B/MATH 571B – Design of Experiments
   STAT 574B/ECON 574B – Bayesian Statistical Theory and Applications **(same as ECON 696E)**
   STAT 574E/MATH 574E/CPH 574E – Environmental Statistics
   STAT 574G/GEOG 574G/MATH 574G – Introduction to Geostatistics
   STAT 574S – Survey Sampling

STAT 574T/MATH 574T – Time Series Analysis, *or*
GEOS 585A – Applied Time Series Analysis
STAT 675 – Statistical Computing
STAT 687/CPH 687/EPID 687 – Theory of Linear Models
STAT 688/ABE 688/CPH 688 – Statistical Consulting

A maximum of 3 units of Statistical Consulting (STAT 688/ABE 688/CPH 688) may be applied towards the Elective PhD Minor course requirements.
A maximum of 3 units of Biostatistics Seminar (CPH 696S/EPID 696S) may be applied towards the Elective PhD Minor course requirements.

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FROM SCHOOL OF GOVERNMENT AND PUBLIC POLICY

Minor Concentration Requirements
Table 1 details the requirements for completion of a minor in each of the five concentrations within the School. As noted above, students looking to complete a minor concentration outside of the SGPP should confirm the requirements for that minor with the host unit.

Table 1: Credit requirements for concentrations

Subfield	Requirements for minor
American Politics	POL595A + 3 x POL596A + comprehensive exam
Comparative Politics	POL595D + 3 x POL596D + comprehensive exam
International Relations	POL595E + 3 x POL596E + comprehensive exam
Public Policy & Management	PA696F (Public Management) + PA 595G (Public Policy) + MGMT580B (Organization Theory) + 1 additional POL/PA Ph.D. course + comprehensive exam
Political Methodology	POL580 + POL582 + POL681 + POL682 + 2 additional methods classes + comprehensive exam