# ECON/ISDS 813 Quantitative Methods-2 NewCrs-2017-03-27

- The workflow icon is no longer available. Please click on the Page Status after the orange circle icon near the page title. *

Form Information

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**The page you originally access is the global template version.  To access the template document that progresses through the workflow, please complete the following steps:**

**First Step**: <u>**ONLY**</u> change the text in the [brackets] so it looks like this: **CRIM 101 Intro to Criminology-CrsRvs-2015-08-10**

- *<span style="color:red">If DUAL LISTED list BOTH courses in the page title</span>*

**Second Step:**  Click **"SAVE"** on bottom right

- *<span style="color:red">DO NOT TYPE ANYTHING INTO THE FIRST PAGE OTHER THAN THE TEXT IN BRACKETS</span>*
- *<span style="color:red">Please be sure to remove the Brackets while renaming the page</span>*

**Third Step:** Make sure the word *<u>DRAFT</u>* is in yellow at the top of the proposal

**Fourth Step**: Click on "<u>**EDIT CONTENTS**</u>"(*not EDIT*) and start completing the template.  When exiting or when done, click **<span style="color:red">"SAVE"</span>** (*not Save Draft*) on bottom right

When ready to submit click on the workflow icon and hit approve.  It will then move to the chair as the next step in the workflow.

*Indicates a required field

| Proposer* | David Yerger | Proposer Email* | yerger@iup.edu |
|---|---|---|---|
| Contact Person* | Prashanth Bharadwaj | Contact Email* | pnb@iup.edu |
| Proposing Department/Unit* | ECON | Contact Phone* | 7-4880 |

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| **(A) Course Prefix*** | *See the Registrar's List of Unavailable Course Numbers at http://www.iup.edu/WorkArea/linkit.aspx?LinkIdentifier=id&ItemID=129323*<br><br>ECON/ISDS |
| **(B) Course Number*** | *If Dual Listed, enter both course numbers*<br><br>813 |
| **(C) Course Title*** | Quantitative Methods-2 |
| **(D) Course Level*** | graduate-level |

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| **(E) Cross Listed\*** <br><br> Dual Listed courses must use the <br><br> Dual Listed form <br><br> Note: both courses to be dual-listed <br><br> must be approved through Senate <br><br> PRIOR to requesting Dual Listing <br><br> *Dual Listed = Courses listed at two levels,* <br><br> *such as undergraduate and graduate,* <br><br> *masters and doctoral, etc.* | *Cross Listed = Course has more than one prefix such as GEOG/RGPL 233* <br><br> YES <br><br><br> If YES, with: |
| **(F) Variable Credit\*** | NO <br><br><br> If YES, enter the number of credits: |
| **(G) Variable Title\*** | NO <br><br><br> If YES, enter the title(s): |
| **(H) Number of Credits\*** | Class Hours:3 <br><br> Lab Hours:0 <br><br> Credits:3 |
| **(I) Repeatable Course\*** <br><br> This is for courses that can be <br><br> Repeated multiple times e.g. Internship | NO <br><br><br> If YES, please complete the following: <br><br>              Number of Credits that May be Repeated: <br><br><br>              Maximum Number of Credits Allowed to be Repeated: |
| **(J) Prerequisite(s)** | Student in the PhD Program or permission |
| **(K) Co-requisite(s)** | *This means that another course must be taken in the same semester as the proposed course* |

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| **(L) Additional Information** | *Check all that apply. Note: Additional documentation will be required*<br><br>*\* Teacher Education: Please complete the Teacher Education section of this form (below)*<br><br>*\* Liberal Studies: Please complete the Liberal Studies section of this form (below)*<br><br>*\* Distance Education: Please complete the Distance Education section of this form (below)* |
| **(M) Recommended Class Size** | YES<br><br>Number (Enter Zero if No):25<br><br>If YES: (Check one of the following reasons and provide a narrative explanation)<br><br>Pedagogical<br><br>Explain (required):<br><br>Doctoral seminar requiring extensive individual mentoring |
| **(N) Catalog Description\*** | *Guidelines: Do not include pre/co-requisite information here. The registrar prefers a concise description of course content, beginning with an active verb.*<br><br>Introduces the application of advanced statistical techniques commonly used in research within economics and business-related disciplines.  Specific topics include time series econometric analysis, panel data regression analysis, limited dependent variable models, confirmatory factor analysis, path analysis, and structural equation modeling.<br><br> Prerequisite: ISDS/ECON 812, Quantitative Research Methods-I. |
| **(O) Student Learning Outcomes\*** | *These should be measurable, appropriate to the course level, and phrased in terms of <u>student achievement,</u> not instructional or content outcomes*<br><br>*If dual listed, indicate additional learning objectives for the higher level course.*<br><br>**Upon completion of this course, the doctoral students will be able to:**<br><br>1. Select data analytic techniques appropriate given the data to be analyzed and the hypotheses to be tested across a wide range of business-related research topics.<br>2. Identify various potential data quality problems, correctly apply diagnostic tests for these problems, and then modify the analytic approach as needed to complete valid statistical analysis.<br>3. Write the program code necessary for completing advanced statistical analysis using a comprehensive statistical analysis package such as Stata, SPSS, or SAS.<br>4. Integrate their findings from a series of data analysis assignments with readings from current research literature in business-related disciplines.<br>5. Critically evaluate published business-related academic research with regards to both the appropriateness of the data used and the validity of the statistical techniques applied to the research question investigated.<br>6. Formulate their own research questions and create a research design appropriate to the data availability constraints. |
| **(P) Brief Course Outline\***<br><br>For Each Outcome Describe<br><br>How the Outcome Will<br><br>Be Achieved | *Give an outline of sufficient detail to communicate the course content to faculty across campus. It is not necessary to include specific readings, calendar, or assignments*<br><br>*As outlined by the federal definition of a "credit hour", the following should be a consideration regarding student work - For every one hour of classroom or*<br><br>*direct faculty instruction, there should be a minimum of two hours of out of class student work.*<br><br>Week 1        Univariate Time Series Forecasting: Part One<br><br>Filtering data for trends and seasonal adjustments; forecasts using trends and seasonal adjustments; forecasts using exponential weighted moving averages;<br><br>Week 2        Univariate Time Series Forecasting: Part Two<br><br>Measuring forecast quality; Testing for autocorrelated disturbances; Ordinary least squares transformations to adjust for autocorrelation; Feasible generalized least squares to adjust for autocorrelation |

Week 3    Models of Stationary Multiple Time Series

Testing for stationarity with a battery of unit root tests; Estimating a reduced form vector auto regression (VAR); Testing for Granger causality in VAR framework; Estimating and interpreting impulse response functions (IRF) and forecast error variance decompositions (FEVD)

Week 4    Models of Non-Stationary Multiple Time Series

Tests for existence of cointegration between variables; identifying the lag structure and number of cointegrating relationships; fitting a vector error correction model (VECM); testing for stability and reasonableness of estimated VECM; causality testing in VECM framework

Week 5    Handling Endogeneity in Relationships Between Variables

Finding or creating instrumental variables; Using two-stage least squares (2SLS) to correct for endogeneity; Using Generalized Method of Moments (GMM) to correct for endogeneity; Testing restrictions in GMM; Testing for relevance of instruments

Week 6    Panel Data Models (combined cross-section and time series data): Part One

One way Fixed effects (FE) models; time effects and two-way FE; One way random effects (RE) models; Testing the appropriateness of RE; Predictions using one-way FE and RE

Week 7    Panel Data Models (combined cross-section and time series data): Part Two

Pooled OLS regression with cluster-robust standard errors; Pooled FGLS estimation; Instrumental variable models for panel data; Dynamic panel-data models; Seemingly unrelated regression (SUR) models; Moving-window regression estimates

Week 8    Models for Binary Outcomes: Estimation, Testing, and Fit

Comparing logit and probit estimation; Hypothesis testing of individual coefficients; Hypothesis testing of multiple coefficients; Alternative measures of fit; Interpreting using regression coefficients; Interpreting using odds ratios; Assessing marginal effects, changes in probabilities

Week 9    Models for Nominal Outcomes

Presentation of multinomial logit model; Testing effects of independent variables; Tests for combining alternatives; Tests for independence of irrelevant alternatives; Interpreting predicted probabilities and marginal effects; Conditional logit models; Rank order logit models; Nested logit models

Week 10    Models for Count Outcomes

Poisson regression model (PRM); Assessing marginal effects in PRM; Interpretation using predicted probabilities from PRM; Negative binomial regression model (NBRM); Comparing PRM versus NBRM; Estimating PRM or NBRM in models with truncated counts

Week 11    Confirmatory Factor Analysis

How different than principal component factor analysis and exploratory factor analysis; Fitting a CFA model; Interpreting CFA results; Assessing goodness of fit; Estimating a two-factor model

Week 12    Path Models and Analysis

Key terminology; Building a path model; Estimating direct, indirect, and total effects; Adding covariates and/or auxiliary variables to the model; non recursive models

Week 13    Structural Equation Modeling (SEM): Part One

Identification of a full SEM; Fitting a full SEM; Assessing modifications of a SEM; Interpreting SEM results

| | Week 14      Structural Equation Modeling (SEM): Part Two<br><br>Imposing equality constraints; Identification and estimation of composite latent variable; Multiple indicators, multiple causes models; Doing multiple group comparisons with SEM |
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| Rationale for Proposal | |
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| **(Q) Why is this Course Being Proposed?*** | This course is developed for the Ph.D. in Business as part of the core of ten courses |
| **(R) University Senate Summary of Rationale** | *Please enter a single paragraph summary/rationale of changes or proposal for University Senate.*<br><br>The knowledge and skills developed for doctoral level training & application via this and other nine courses in the core are deemed essential to pursue the doctoral seminar and dissertation in functional and cross-disciplinary areas |
| **(S) How Does it Fit into the Departmental Curriculum?*** | *Check all that apply*<br><br>Core Requirement<br>Other<br><br><br>If Other, please explain:<br><br>This course is one of the core requirements of the Ph.D. in Business |
| **(T) Is a Similar Class Offered in Other Departments?*** | NO<br><br><br>Please Provide Comment: |
| **(U)Does it Serve the College /University Above and**<br><br>**Beyond the Role it Serves in the Department?*** | YES<br><br><br>Please Provide Comment:<br><br>This course is one of the core requirements of the Ph.D. in Business |
| **(V) Who is the Target Audience for the Course?*** | Course Designed for Majors<br><br>Other<br><br>If Other, please explain:<br><br>Students enrolled in the Ph.D. in Business |

| (W) Implications for Other Departments* | A. What are the implications for other departments? |
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| | (For Example: overlap of content with other disciplines, requirements for other programs) |
| | N/A |
| | B. How have you addressed this with other department(s) involved? What was the outcome of that attempt? |
| **(X) Attach Supporting Documents for Implications,** <br><br> **if Necessary** | **File      Modified** |
| **(Y) Are the Resources Adequate?*** | *(i.e. faculty, space, equipment, laboratory supplies, library materials, travel funds, etc.)* <br><br> YES <br><br> Please Provide Comment: |

## Distance Education Section

*- Complete this section only if adding Distance Education to a New or Existing Course*

| If Completing this Section, <br><br> Check the Box to the Right: | **NOTE: you must check this box if the Course has previously been approved for Distance Education** |
|---|---|
| **Course Prefix/Number** | |
| **Course Title** | |
| **Type of Proposal** | *See CBA, Art. 42.D.1 for Definition* |
| **Brief Course Outline** | *Give an outline of sufficient detail to communicate the course content to faculty across campus. It is not necessary to include specific readings, calendar or assignments* <br><br> *As outlined by the federal definition of a "credit hour", the following should be a consideration regarding student work - For every one hour of classroom or* <br><br> *direct faculty instruction, there should be a minimum of two hours of out of class student work.* |
| **Rationale for Proposal (Required Questions from CBA)** ||
| **How is/are the instructor(s) qualified** <br><br> **in the Distance Education delivery** <br><br> **method as well as the discipline?** | |

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| **For each outcome in the course, describe**<br><br>**how the outcome will be achieved using**<br><br>**Distance Education technologies.** | |
| **How will the instructor-student and**<br><br>**student-student interaction take place?**<br><br>**(if applicable)** | |
| **How will student achievement be evaluated?** | |
| **How will academic honesty for tests**<br><br>**and assignments be addressed?** | |

## Liberal Studies Section

*- Complete this section only for a new Liberal Studies course or Liberal Studies course revision*

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| **If Completing this Section,**<br><br>**Check the Box to the Right:** | **NOTE: you must check this box if the Course/Program has previously been approved for Liberal Studies** |

| **Liberal Studies Course Designations (Check all that apply)** | |
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| **Learning Skills:** | |
| **Knowledge Area:** | |
| | |
| | |
| **Liberal Studies Elective** | *Please mark the designation(s) that apply - must meet at least one* |
| **Expected Undergraduate Student**<br><br>**Learning Outcomes**<br><br>**(EUSLOs)** | *Describe how each Student Learning Outcome in the course enables students to become Informed Learners, Empowered Learners and/or Responsible Learners*<br><br>*See http://www.iup.edu/WorkArea/DownloadAsset.aspx?id=181694* |
| **Description of the Required**<br><br>**Content for this Category** | *Narrative on how the course will address the Selected Category Content* |
| **All Liberal Studies courses are required to include perspectives on cultures and have a supplemental reading.**<br><br>**Please answer the following questions.** | |

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| **Liberal Studies courses must include**<br><br>**the perspectives and contributions**<br><br>**of ethnic and racial minorities and**<br><br>**of women whenever appropriate to**<br><br>**the subject matter.  Please explain**<br><br>**how this course will meet this**<br><br>**criterion.** | |
| **Liberal Studies courses require the**<br><br>**reading and use by students of at**<br><br>**least one non-textbook work of**<br><br>**fiction or non-fiction or a collection**<br><br>**of related articles.  Please describe**<br><br>**how your course will meet this**<br><br>**criterion.** | |

## Teacher Education Section

*- Complete this section only for a new Teacher Education course or Teacher Education course revision*

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| **If Completing this Section,**<br><br>**Check the Box to the Right:** | **NOTE: you must check this box if the Course/Program has previously been approved for Teacher Education related items** |
| **Course Designations:** | |
| **Key Assessments** | |
| | For both new and revised courses, please attach (see the program education coordinator):<br><br>• The Overall Program Assessment Matrix<br>• The Key Assessment Guidelines<br>• The Key Assessment Rubric<br><br>      **File**      **Modified**<br><br>No files shared here yet.<br>• Drag and drop to upload or browse for files |
| **Narrative Description of the**<br><br>**Required Content** | *How the proposal relates to the Education Major* |

Please scroll to the top and click the Page Status if you are ready to take action on the workflow.
Please submit an ihelp if you have any questions http://ihelp.iup.edu