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| --- | --- |
| **Course Title:** | Econometrics |
| **Course Code:** | STAT 401 |
| **Program:** | Statistics |
| **Department:** | Statistics and Operations Research |
| **College:** | Science |
| **Institution:** | King Saud University |

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**A. Course Identification**

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **1. Credit hours:** | | | | 2(2+0+0) | | | | | | | | | | | | |
| **2. Course type** | | | | | | | | | | | | | | | | |
| **a.** | University | |  | | College | | |  | Department | | | |  | Others |  |  |
| **b.** | | Required | | | |  | Elective | | |  |  | | | | | |
| **3. Level/year at which this course is offered:** | | | | | | | | | | | | **Level 8/ Year 4** | | | | |
| **4. Pre-requisites for this course** (if any)**:**  STAT 332 | | | | | | | | | | | | | | | | |
| **5. Co-requisites for this course** (if any)**:** | | | | | | | | | | | | | | | | |
|  | | | | | | | | | | | | | | | | |

**6. Mode of Instruction** (mark all that apply)

|  |  |  |  |
| --- | --- | --- | --- |
| **No** | **Mode of Instruction** | **Contact Hours** | **Percentage** |
| **1** | **Traditional classroom** | 3 | 100% |
| **2** | **Blended** |  |  |
| **3** | **E-learning** |  |  |
| **4** | **Correspondence** |  |  |
| **5** | **Other** |  |  |

**7. Actual Learning Hours** (based on academic semester)

|  |  |  |
| --- | --- | --- |
| **No** | **Activity** | **Learning Hours** |
| **Contact Hours** | | |
| **1** | **Lecture** | 30 |
| **2** | **Laboratory/Studio** | 15 |
| **3** | **Tutorial** | 0 |
| **4** | **Others** (specify) | 0 |
|  | **Total** | 45 |
| **Other Learning Hours\*** | | |
| **1** | **Study** | 40 |
| **2** | **Assignments** |  |
| **3** | **Library** | 20 |
| **4** | **Projects/Research Essays/Theses** | 40 |
| **5** | **Others** (specify) |  |
|  | **Total** | 100 |

**\*** The length of time that a learner takes to complete learning activities that lead to achievement of course learning outcomes, such as study time, homework assignments, projects, preparing presentations, library times

**B. Course Objectives and Learning Outcomes**

|  |
| --- |
| **1. Course Description**  The course contains a various topics and techniques of Data Analysis using statistical software. It starts briefly with statistical description and representation topics, and then moves widely to statistical inference. It covers important topics that are commonly used in real-life applications, specifically Calculation of the estimated parameters of the regression model (simple and multiple), Confidence Intervals, Hypotheses Testing, Sum of Squares (Regression, Error and Total), Problems of regression model (Multicollinearity, Heteroscedasticity, Autocorrelation and Equations-errors in variables), Simultaneous-equations methods and Time series models. |
|  |
| **2. Course Main Objective** |
| Students after completing the course will have:   * Give students theoretical and practical background on the use of statistical models in the econometrics. * Student knows how to build or construct the economic model and economic relations * Discuss the concept of dummy variables and general form of multi-regression model * Econometrics problems and how to remedy it * Understanding how to select the best methods to analysis data by using software R * Ability to give right interpretations of statistical results * The skills to prepare and write statistical reports * Gain some advantages: self-confidence, Responsibility, Respect the other ideas, discussion, discussion in groups and Leadership |

**3. Course Learning Outcomes**

|  |  |  |
| --- | --- | --- |
| **CLOs** | | **Aligned****PLOs** |
| 1 | **Knowledge:** |  |
| 1.1 | Describe the basic principles of the Simple and Multiple regression models. | K2 |
| 1.2 | Non-Linear regression models - Dummy Variables | K2 |
| 1.3 | Demonstrate the knowledge of the types of errors. Time series models- Simultaneous | K3 |
| 1.4 | Explain the meaning of statistical tests and decisions making. | K4 |
| 1.5 | Interpret the relevant statistical literature | K4 |
| **2** | **Skills :** |  |
| 2.1 | Demonstrate capability of choosing the appropriate statistical test for a particular application. | S1 |
| 2.2 | Formulate significant research questions, use appropriate statistical tests, and analyze and interpret the results. | S4 |
| 2.3 | Read, evaluate, and interpret numerical, statistical and general scientific information. | S4 |
| 2.4 | Search and use the statistical literature in both printed and electronic formats. | S3 |
| 2.5 | Apply critical thinking and hypothesis-driven methods of scientific inquiry. | S3 |
| **3** | **Competence:** |  |
| 3.1 | Work effectively both individually and in teams in both classroom and computer labs. | C2 |
| 3.2 | Demonstrate the ethical and regulations articulated by the university. | C2 |
| 3.3 | Understand the interrelationships among statistics, technology, and global society, and of the societal implications of new developments in science. | C3 |
| 3.4 | The ability to use computers for statistical tests and computation, data acquisition, and database usage. | C3 |

**C. Course Content**

|  |  |  |
| --- | --- | --- |
| **No** | **List of Topics** | **Contact Hours** |
| 1 | Simple and Multiple regression models | 3 |
| 2 | Non-Linear regression models - Dummy Variables | 6 |
| 3 | Multicollinearity - Problem Identification Errors | 6 |
| 4 | Generalized Least Square Method | 6 |
| 5 | Heteroscedasticity Problem | 3 |
| 6 | Autocorrelation Problem | 6 |
| 7 | Equations-errors in variables | 3 |
| 8 | Simultaneous-equations methods | 6 |
| 9 | Time series models | 6 |
| **Total** | | 45 |

**D. Teaching and Assessment**

**1. Alignment of Course Learning Outcomes with Teaching Strategies and Assessment Methods**

|  |  |  |  |
| --- | --- | --- | --- |
| **Code** | **Course Learning Outcomes** | **Teaching Strategies** | **Assessment Methods** |
| **1.0** | **Knowledge** | | |
| 1.1 | Describe the basic principles of the Simple and Multiple regression models. | Lecture | Written exams |
| 1.2 | Non-Linear regression models - Dummy Variables | Lecture | Written exams |
| 1.3 | Demonstrate capability of choosing the appropriate statistical test for a particular application. | Lecture | Written exams |
| 1.4 | Explain the meaning of statistical tests and decisions making. | Lecture | Written exams |
| 1.5 | Interpret the relevant statistical literature | Lecture | Written exams |
| **2.0** | **Skills** | | |
| 2.1 | Demonstrate capability of choosing the appropriate statistical test for a particular application. | Lecture + Laboratory/Studio | Written exams |
| 2.2 | Formulate significant research questions, use appropriate statistical tests, and analyze and interpret the results. | Lecture + Laboratory/Studio | Written exams |
| 2.3 | Read, evaluate, and interpret numerical, statistical and general scientific information. | Lecture + Laboratory/Studio | Written exams |
| 2.4 | Search and use the statistical literature in both printed and electronic formats. | Lecture+ Laboratory/Studio | Written exams  Oral questions |
| 2.5 | Apply critical thinking and hypothesis-driven methods of scientific inquiry. | Lecture + Laboratory/Studio | Written exams |
| **3.0** | **Competence** | | |
| 3.1 | Work effectively both individually and in teams in both classroom and computer labs. | Lecture + Laboratory/Studio | Oral questions  Written exams |
| 3.2 | Demonstrate the ethical and regulations articulated by the university. | Lecture + Laboratory/Studio | Oral questions |
| 3.3 | Understand the interrelationships among statistics, technology, and global society, and of the societal implications of new developments in science. | Lecture + Laboratory/Studio | Written exams |
| 3.4 | The ability to use computers for statistical tests and computation, data acquisition, and database usage. | Lecture + Laboratory/Studio | Written exams |

**2. Assessment Tasks for Students**

|  |  |  |  |
| --- | --- | --- | --- |
| **#** | **Assessment task\*** | **Week Due** | **Percentage of Total Assessment Score** |
| **1** | Discussion and participation in the classroom | weekly | 10% |
| **2** | First Exam | 7 | 25% |
| **3** | Second Exam | 10 | 25% |
| **4** | Final Exam | 16 | 40% |

**\*Assessment task** (i.e., written test, oral test, oral presentation, group project, essay, etc.)

**E. Student Academic Counseling and Support**

|  |
| --- |
| **Arrangements for availability of faculty and teaching staff for individual student consultations and academic advice :** |
| For at least five hours a week, faculty and teaching staff are available to provide student consultations and academic advice. |

**F. Learning Resources and Facilities**

**1.Learning Resources**

|  |  |
| --- | --- |
| **Required Textbooks** | Basic Econometrics 6th Edition (by Damodar N. Gujarati, and Dawn C. Porter) 2015 McGraw Hill |
| **Essential References Materials** | Introduction to Econometrics, Gary Koop, 2008, Wiley Ed.  Econometrics Franco Peracchi 2000, Wiley Ed. |
| **Electronic Materials** | Websites on the internet that are relevant to the topics of the course. |
| **Other Learning Materials** | Multi-media associated with the text book and the relevant websites. |

**2. Facilities Required**

|  |  |
| --- | --- |
| **Item** | **Resources** |
| **Accommodation**  (Classrooms, laboratories, demonstration rooms/labs, etc.) | Good |
| **Technology Resources**  (AV, data show, Smart Board, software, etc.) | R Statistical software  Data show  Smart Board |
| **Other Resources**  (Specify, e.g. if specific laboratory equipment is required, list requirements or attach a list) |  |

**G. Course Quality Evaluation**

|  |  |  |
| --- | --- | --- |
| **Evaluation**  **Areas/Issues** | **Evaluators** | **Evaluation Methods** |
| Effectiveness of teaching | Students | Indirect (Oral questions) |
| Quality of learning resources | Students | Indirect (Oral questions) |
| Achievement of course learning outcomes | Faculty | Direct (Written exam) |

**Evaluation areas** (e.g., Effectiveness of teaching and assessment, Extent of achievement of course learning outcomes, Quality of learning resources, etc.)

**Evaluators** (Students, Faculty, Program Leaders, Peer Reviewer, Others (specify)

**Assessment Methods** (Direct, Indirect)

**H. Specification Approval Data**

|  |  |
| --- | --- |
| **Council / Committee** | Course instructor\ **Dr. Mohamed Abdelkader** |
| **Reference No.** |  |
| **Date** | 15/01/2020 – 20/5/1441 |