

# **College of Management**

# **Fu Jen Catholic University**

## **2020-2021 Course Catalog**



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# Statistics and Information Science

## Course list

BBA Program in Statistics and Information Science		Code	Classes	Credit hours
Required common credit hours of the department	Statistics	02222	2	6
	Calculus	02390	2	6
	Economics	02457	2	6
	Accounting	02412	2	6
	Introduction to Business	05201	2	3
	Introduction to Programming	24495	2	3
	Mathematical Statistics	02743	2	6
	Linear Algebra	02766	2	4
	Programming Techniques	03056	2	3
	Advanced Programming Techniques	14761	2	3
	Application of Statistics Package	10931	2	2
	Management Information Systems	02631	2	3
	Database Administration	02490	2	3
	Survey Sampling-Course in English	24118	2	3
	Regression Analysis	01987	2	3
	Design of Experiment and Analysis	11218	2	3
	Data Mining-Course in English	21197	2	3
	Independent Study I	07344	10	3
Independent Study II	07699	10	3	
Elective credit hours by sections *	Multivariate Statistical Analysis-Course in English	19169	1	3
	Nonparametric Statistics	02303	1	3
	Biostatistics	05352	1	2
	Medical Statistics	05358	1	3
	Inference Statistics	06424	1	3
	Electronic Commerce-Course in English	17559	1	3
	Marketing Management	01483	1	3
	Applied Statistical System Development -course in English	22143	1	3
	Datebase Practice-Course in English	23181	1	3
	Data Exploration and Information Visualization	24327	1	3
	Financial Management-Course in English	13515	1	3
	Money and Banking	02249	1	3
lective credit hours of the department in other sections	The Theory of Interest	04791	1	3
	Practice of Statistical Decision	09626	1	3
	English Conversation	01846	3	6
	Applied Business English: Listening & Reading	19199	1	2
	Organizational Leadership and Social Innovation Practices	19663	1	2
	Organizational Learning and Social Inquiry	19664	1	2
	Internship Capability Cultivation program	32175	1	1

## Course objective and prerequisites

Course Code	02222			
Course Name	Statistics	Credit	F	S
Course Objectives	<p>The objective of this course is to provide the students with the essential and fundamental concepts of elementary statistics. This course is designed to stress an intuitive understanding of statistical procedures and logical principles behind the formula. A wide selection of real problems and examples from many various fields are introduced. It emphasizes that Statistics is used as a tool in decision-making in virtually all areas of management sciences.</p> <p>This course will cover:</p> <ol style="list-style-type: none"> <li>1. Statistics methods and concept and its relevance to the real world.</li> <li>2. Descriptive Statistics.</li> <li>3. Basic notions of probability, random variable, and discrete and continuous probability distribution.</li> <li>4. Sampling methods.</li> <li>5. Statistical inference – interval estimation.</li> </ol>			

Course Code	02390			
Course Name	Calculus	Credit	F	S
Course Objectives	<p>This is a one-year introductory course in Calculus intended for students with background in high school mathematics. The contents of this course include basic concepts and theory in calculus and their applications. In the first semester, topics in one-variable differential calculus such as limit, continuity, derivative, chain rule, implicit differentiation, the mean value theorem, and applications of the derivative will be introduced. In the second semester, topics in the fundamental theorem of calculus, techniques in integration, multivariate differential and integral calculus such as partial derivatives and multiple integrals will be covered. The objectives of this course are</p> <ol style="list-style-type: none"> <li>1. To provide the core of the central idea and methods of calculus that will be applied in the solution of problems in a variety of applied science and application for further study;</li> <li>2. To illustrate the main concepts by a variety of examples and exercises; and</li> <li>3. To have an overall understanding in calculus.</li> </ol>			

Course Code	02457			
Course Name	Economics	Credit	F	S
Course Objectives	<p>The objective of this course is to provide students with basic Microeconomic concepts and to improve students' abilities to analyze individual consumer, household, and firm's behavior. Upon course completion, the students should be able to:</p>			

	<ol style="list-style-type: none"> <li>1. Realize the basic concepts of Microeconomics.</li> <li>2. Understand the meanings of supply and demand functions.</li> <li>3. Realize the meaning of elasticity and its application.</li> <li>4. Realize how individual consumer, household, and firm make decision.</li> <li>5. Understand various types of industry organizations and their characteristics.</li> <li>6. Use Microeconomics theories to analyze the effects of public policy.</li> <li>7. Realize the basic concepts of macroeconomics.</li> <li>8. Understand the meanings and measuring of Nation's income.</li> <li>9. Realize the meaning of production, saving, and investment.</li> <li>10. Understand the monetary system.</li> <li>11. Understand the meanings of aggregate demand and aggregate supply.</li> <li>12. Use macroeconomics theories to analyze the effects of macroeconomic policy.</li> </ol>
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Course Code	02412			
Course Name	Accounting	Credit	F	S
Course Objectives	<p>The objective of this course is to introduce the basic processes of accounting information system, the principle and rules of accounting measurement and reporting, and how to analyze and interpret accounting information to help internal and external business users making economic decisions in order to create value for business enterprises and enhance the fairness and efficiency of the capital market. It emphasizes the dual roles of accounting in valuation and contracting. Specifically, this course aims to help students:</p> <ol style="list-style-type: none"> <li>1. To understand the functioning of accounting in the business world as well as the governmental units, non-profit organizations and the society in general;</li> <li>2. To understand the basic recording and reporting processes of accounting information system;</li> <li>3. To understand the concepts and standards underlying the measurements used in accounting to develop the financial statements of businesses;</li> <li>4. To understand how to analyze and interpret accounting information to help investors, creditors and business managers to make economic decisions;</li> <li>5. To understand how to resolve the ethical dilemma and make ethical professional judgment; and</li> <li>6. To understand how to develop and make planning of an accounting career.</li> </ol>			

Course Code	05201			
Course Name	Introduction to Business	Credit	F	S
Course Objectives	<p>The objectives of this course are</p> <ol style="list-style-type: none"> <li>1.To gain a fundamental working knowledge about every aspect of the environment in which business prospers;</li> <li>2.To introduce business functions, including marketing, finance, human resources, production &amp; operation, information, and R&amp;D;</li> <li>3.To introduce management functions, including analysis, planning, organizing, leading, and controlling;</li> <li>4.To integrate the factors of environment, management functions and business functions; and</li> </ol>			

	5.To combine theory and practice.
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Course Code	24495			
Course Name	Introduction to Programming	Credit	F	S
Course Objectives	The objective of this course is to let the students learn to use a programming language to solve problems. The main contents of the course is the Python programming language, covering basic concepts of variables, expressions, data types, command structures, conditions, loops, functions, as well as listings. Courses will also use some simple tools so that students can master the logics and problem solving ability as soon as possible.			

Course Code	02743			
Course Name	Mathematical Statistics	Credit	F	S
Course Objectives	The objective of this course is to provide the students with the core of the central idea and methods of statistics that will be applied in the solution of problems in statistical theory and application for further study. The fundamentals of modern probability theory will be introduced first, followed by sampling distribution theory, and then the basic theory of statistical inference will be provided. The main concepts will be illustrated by a variety of examples and exercises.			

Course Code	02766			
Course Name	Linear Algebra	Credit	F	S
Course Objectives	There are two main objectives of this course: 1.To understand and build up the concepts of the linear algebra; and 2.To lean how to use Matlab software for solving the linear algebra problem at hand.			

Course Code	03056			
Course Name	Programming Techniques	Credit	F	S
Course Objectives	The first course of programming language for the student majoring Statistics should accomplish two goal : 1. Introduce students to the breadth of the discipline of computing, so that they come to understand the role of programming in the broader context of computing. 2.Introduce the methodologies and techniques of computer programming using C++, providing a complete introduction to the language.			

Course Code	14761			
Course Name	Advanced Programming Techniques	Credit	F	S
Course Objectives	Object-Oriented Programming (OOP) is a new approach to programming that emphasized the modeling of objects through classes and inheritance. To facilitate the modeling of real world object, C++ provides not only multiple inheritance, but			

	also operator overloading, template, and polymorphism. Standard Template Library (STL) gives programmer a easy way to overcome difficult problem, which is also achieved by OOP technique.
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Course Code	10931			
Course Name	Application of Statistics Package	Credit	F	S
Course Objectives	<p>The objectives of this courses are</p> <ol style="list-style-type: none"> <li>1.To build basic ideas in operating software packages of statistics for the needs in managerial or analytical works;</li> <li>2.To render examples or cases in daily life or in managerial applications along with statistics lectures; and</li> <li>3.To be able to use the software packages such as SAS and SPSS.</li> </ol>			

Course Code	02631			
Course Name	Management Information Systems	Credit	F	S
Course Objectives	<p>The objective of this course is to provide the students to understand how the information technology (IT) supports organizations with strategic advantage by facilitating problem solving, increasing productivity and quality, increasing speed, improving customer service, enhancing communication and collaboration, and enabling business process restructuring. This course covers the practical, managerial-oriented approach, and how IT is being provided by information systems departments, vendors, service providers, supply chain partners, and end users.</p>			

Course Code	02490			
Course Name	Database Administration	Credit	F	S
Course Objectives	<p>This course provides fundamental concepts and principles for designing, implementing and managing database systems. Topics include database concepts, relational database design concepts, Structured Query Language (SQL), database administration. A DBMS will be incorporated into the course exercises and as part of a project on the design and implementation of a database system.</p>			

Course Code	24118			
Course Name	Survey Sampling-Course in English	Credit	F	S
Course Objectives	<ol style="list-style-type: none"> <li>1. Construct the basic concepts and theory of survey.</li> <li>2. Teach the method of collecting data.</li> <li>3. The questionnaire design.</li> <li>4. Using cases or examples of practice application, this course make students learning in doing.</li> </ol>			

Course Code	01987			
Course Name	Regression Analysis	Credit	F	S

Course Objectives	This course provides fundamental concepts and skills for regression analysis. Topics include model specifications, properties and related inferences. Procedures for building a linear regression model will be discussed thoroughly and actual data will be analyzed with statistical software.			

Course Code	11218			
Course Name	Design of Experiment and Analysis	Credit	F	S
Course Objectives	<p>The objectives of this course are</p> <ol style="list-style-type: none"> <li>1.To provides fundamental concepts and skills for design and analysis of experiment;</li> <li>2.To cover the topics such as complete randomized design, factorial design, randomized block design, Latin Square design, and fractional factorial design. one-way and two-way ANOVA model; and</li> <li>3.To discuss and analyze the real data with statistical software.</li> </ol>			

Course Code	21197			
Course Name	Data Mining-Course in English	Credit	F	S
Course Objectives	<ol style="list-style-type: none"> <li>1.Understand DM concept</li> <li>2.Using DM Tools</li> <li>3.Understand DM methodology</li> <li>4.Understand DM application</li> </ol>			

Course Code	07344			
Course Name	Independent Study I	Credit	F	S
Course Objectives	<p>The objectives of this course are</p> <ol style="list-style-type: none"> <li>1.To obtain independent thinking ability;</li> <li>2.To be able to read the literature;</li> <li>3.To be able to write papers; and</li> <li>4.To cultivate analytical skills in solving the practical problem.</li> </ol>			

Course Code	07699			
Course Name	Independent Study II	Credit	F	S
Course Objectives	<p>The objective of this course are</p> <ol style="list-style-type: none"> <li>1.To find an interesting topic, define research question, collect data, and accomplish a research report; and</li> <li>2.To be able to:(1) observe social environment and phenomenon.; (2) find an interesting topic as well as question.; (3) define a research question.; (4) understand the basic concept and methodology of research.; (5) collect and summarize data.; (6) write and accomplish a project report.</li> </ol>			

Course Code	19169			
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Course Name	Multivariate Statistical Analysis-Course in English	Credit	F	S
Course Objectives	As data collection becomes more and more efficient and convenient, more features tend to be measured in each observation. This trend makes multivariate data analysis an important statistical technique nowadays. In this course, two objectives are the foundation for developing this course. First, the concept of multivariate data analysis methods, such as distance measure, multivariate control chart, principle component analysis, factor analysis, discrimination, classification, and clustering. The basic idea for each method will be introduced in the class, so that students will be familiar with the insight of methods. Second, the ability of performing real data analysis. How to use computer software, such as SPSS and R, to perform multivariate data analysis methods will also be introduced in this class.			

Course Code	20834			
Course Name	Time Series Analysis-Course in English	Credit	F	S
Course Objectives	Time series analysis is essential for today's world. Our objective is to develop competent skill in analyzing time series data for description, explanation, and forecast. This skill combines knowledge of probabilistic models of stochastic processes, empirical comparisons of approaches, and computer software. The main topical coverage will be construction and interpretation of various time series approaches. These approaches involve: time series regression, exponential smoothing, Box-Jenkins (ARIMA) methodology, and intervention analysis.			

Course Code	02303			
Course Name	Nonparametric Statistics	Credit	F	S
Course Objectives	The objectives of this course are 1. To introduce the modern nonparametric statistics that comprises a broad range of methods for data analysis, namely, rank based methods, permutation test, bootstrap, and curve smoothing; and 2. To be able to apply nonparametric methods in problem solving when the normal assumption is violated.			

Course Code	05352			
Course Name	Biostatistics	Credit	F	S
Course Objectives	The main purpose of biostatistics is to resolve the real problems generated from biological subjects. The conclusions are obtained through experimental studies or sampling. In this course three major topics: clinical trials, genetics and general medicine will be discussed. The lectures will emphasize on statistical concepts. Topics such as likelihood principles, regression methods, logistic regression and survival analysis will be introduced.			

Course Code	05358			
Course Name	Medical Statistics	Credit	F	S
Course Objectives	<p>The main purpose of this course is to demonstrate how to use the developed statistical methodologies to resolve the problems generated from various medical subjects. Scientific conclusions are reached through experimental or sampling studies. In this course several major issues, which include preventive medicine, epidemiology, genetic counseling, forensic medicine, pharmaceutical industry, human genome studies, are introduced. The lectures will emphasize on the medical scenarios and related statistical methods based on Bayes theorem, likelihood principle, conditional probability setting and modeling.</p>			

Course Code	06424			
Course Name	Inference Statistics	Credit	F	S
Course Objectives	<p>The objectives of this course are</p> <ol style="list-style-type: none"> <li>1.To concentrate on the fundamental aspects of statistical inference, rather than the particular methods used in various disciplines; and</li> <li>2.To provide a deeper understanding the theoretical part of statistical inference</li> </ol> <p>The topics to be covered include point estimation, interval estimation and testing hypotheses.</p>			

Course Code	17559			
Course Name	Electronic Commerce-Course in English	Credit	F	S
Course Objectives	<p>The main objectives of this course are for students:</p> <ol style="list-style-type: none"> <li>1. To learn the fundamental concepts of electronic business;</li> <li>2. To investigate the main issues of electronic commerce in terms of models. system framework, IT infrastructure and strategies of implementation with its cost benefit;</li> <li>3. To learn how e-commerce is being conducted and managed; and</li> <li>4. To assess its major opportunities, limitations, issues, and risks in this contemporary Internet business environment.</li> </ol>			

Course Code	02492			
Course Name	Data Structures	Credit	F	S
Course Objectives	<p>This course provides fundamental concepts of data structure and algorithms in computer science. Topics include introduction of basic data structures and basic algorithms, study of comparing data structures using different representation schemes, exploring different sorting and searching methods. The implementations and applications of data structures in a programming language are conducted.</p>			

Course Code	02249			
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Course Name	Money and Banking	Credit	F	S
Course Objectives	<p>In this course, we provide an overview of the finance markets, with emphasis on the monetary and banking. Students are expected to understand the following questions after studying in this course:</p> <ol style="list-style-type: none"> <li>1. What role does the money play in the economy?</li> <li>2. How are interest rates determined and how do they behave?</li> <li>3. Why are the financial institutions important in the economics?</li> <li>4. What tools does central bank use to manipulate the money supply and interest rate?</li> </ol>			

Course Code	01483			
Course Name	Marketing Management	Credit	F	S
Course Objectives	<p>The objective of this course is to provide students with basic marketing concepts and to improve students' abilities to implement marketing related activities. Upon course completion, the students should be able to:</p> <ol style="list-style-type: none"> <li>1. Realize the basic concepts of marketing.</li> <li>2. Understand the meanings and procedure of marketing plan.</li> <li>3. Realize the meaning of segmenting, targeting, and positioning (STP).</li> <li>4. Understand the meaning and scopes of marketing mix 4P.</li> <li>5. Utilize marketing theory to analyze firm's marketing activities.</li> <li>6. Learn the skill of marketing planning and apply Marketing Management in an effective manner.</li> </ol>			

Course Code	22143			
Course Name	Applied Statistical System Development -course in English	Credit	F	S
Course Objectives	<p>This is an advanced course aimed at applying JAVA technology to the development of practical statistical systems. In this course, students will learn programming skills related to (1) the SWING components (2) JDBC Database Access (3) 2D Graphics and (4) API for a Statistical Package. By the end of this course students will be able to develop statistical systems of basic applications for data analysis.</p>			

Course Code	23181			
Course Name	Datebase Practice-Course in English	Credit	F	S
Course Objectives	<p>This course is designed to provide students with the knowledge and skills to perform the following tasks: (1) writing of basic SQL statements (DML/DDL), and (2) writing of advanced SQL statements (includes an introduction to stored procedures).</p> <p>This course will be taught using a combination of classroom lectures and lab exercises. The database server for lab exercises will be a DB2 for UDB system on Windows platform. Students will utilize the facilities of the DB2 client to learn the knowledge and skills for performing the aforementioned tasks.</p>			

Course Code	24327			
Course Name	Data Exploration and Information Visualization	Credit	F	S
Course Objectives	R is a relatively new statistical software; however, it gathers tremendous attentions in various fields due to its flexibility, capability, and lots of attractive features. The not-so-user-friendly property might be the key problem for the R beginner. Therefore, the goal of this course is to lead the students to be familiar with R; including its basic operations, environments, data types, basic functions and some programming skills. Hopefully, after taking this course, students can enjoy and be very confident of using R in their following data analysis task.			

Course Code	21196			
Course Name	Discrete data analysis- Course in English	Credit	F	S
Course Objectives	<p>This course provides basic and essential methods for analyzing discrete- typed data.</p> <p>The major focus of this course is modeling of discrete- typed response techniques. In general, this course is designed into five sessions:</p> <ol style="list-style-type: none"> <li>1. The material in this part forms the heart of introductory methods used in univariate categorical data analysis.</li> <li>2. This part surveys standard descriptive and inferential method for bivariate contingency tables.</li> <li>3. This session introduces generalized linear models for binary data, in terms of Logistic regression;</li> <li>4. Discusses log-linear models for poisson (count data). Both Session III and IV are instructed by unifying logistic regression and loglinear models with ordinary regression and ANOVA models since these methods share many similar / different concepts.</li> <li>5. Detail user manuals written in SPSS setting to enhanced understanding of the context of statistical models. Supplement materials to cover topics in previous sessions.</li> </ol>			

Course Code	04791			
Course Name	The Theory of Interest	Credit	F	S
Course Objectives	The objective of this course is to help students obtain basic concepts on interest and its related knowledge.			

Course Code	09626			
Course Name	Practice of Statistical Decision	Credit	F	S
Course Objectives	<p>The objectives of this course are</p> <ol style="list-style-type: none"> <li>1. To provide the fundamental concepts and skills for statistical decisions; and</li> <li>2. To include case study for a better understanding its application on business.</li> </ol> <p>Topics to be covered include probability, modeling and its decision making, Bayesian decision making, Lagrange multiplier, decision making under certainty &amp; uncertainty.</p>			

Course Code	01846			
Course Name	English Conversation	Credit	F	S

Course Objectives	1.To enhance the students general English proficiency; and 2.To practice daily and academic language skills in listening and speaking.			

Course Code	19199			
Course Name	Applied Business English: Listening & Reading	Credit	F	S
Course Objectives	This remedial course is aimed at helping senior students with test-taking skills for standardized tests (esp. for TOEIC) in the hope of achieving more satisfactory results to meet the basic requirements of their English proficiency before graduation. The emphases of the courses will be on listening and reading.			

Course Code	19663			
Course Name	Organizational Leadership and Social Innovation Practices	Credit	F	S
Course Objectives	<ol style="list-style-type: none"> <li>1. To be to internalize the spirit of autonomous learning;</li> <li>2. To be able to build a team and cooperate with each other within the team;</li> <li>3. To be able to manage the group dynamic of an organization;</li> <li>4. To be able to implement the selected project and achieve the set goals;</li> <li>5. To be able to run an organization to have high performance; and</li> <li>6. To be able to have the vision and capacity to be a leader.</li> </ol>			

Course Code	19664			
Course Name	Organizational Learning and Social Inquiry	Credit	F	S
Course Objectives	<p>The objectives of this course are</p> <ol style="list-style-type: none"> <li>1.To be able to internalize the spirit of autonomous learning;</li> <li>2.To be able to build a team and cooperate with each other within the team;</li> <li>3.To be able to handle the implement process of a project;</li> <li>4.To be able to manage the group dynamic of an organization; and</li> <li>5.To be able to implement the selected project and achieve the set goals.</li> </ol>			

Course Code	32175			
Course Name	Internship Capability Cultivation program	Credit	F	S
Course Objectives	The main purpose of this course is to provide internship capability cultivation for sophomore and senior students. The course is developed to give students well understanding of their potential career and provide pre-training courses for internship to cultivate their internship capability. Tis course requires students to feedback what they have experienced and impression in pre-training of internship courses to the classroom dialogues.			