

Course and Learning Guide – Business Statistics

Welcome to Business Statistics. This Course and Learning Guide is divided into two parts:

Part 1 provides you with general information about this course, which includes contact details of relevant academic staff in Australia, information about the unit of competency you are studying and student rights and responsibilities. This part is the official RMIT University Course Guide.

Part 2 provides you with specific information about your study schedule and assessment details.

Good luck with your studies in Business Statistics!

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Part 1: Course Guide:

A. Course Identification

| | |
|-----------------------------------|---|
| 1. Course Name | Prepare financial forecasts and projections |
| 2. Course Number | FNBFIN70A |
| 3. Program Name | Diploma of Business |
| 4. Program Number | C5130 |
| 5. Faculty | Business |
| 6. Owing Department/School | School of Economics and Finance (VET) |
| 7. Contact | Program Director Theresa Lyford Phone: 9925 5444 Fax: 9925 5650 Email: theresa.lyford@rmit.edu.au |
| 8. Duration: | one semester |
| 9. Mode of delivery | Mixed mode, face-to-face, online |
| 10. Campus | City, Distance, On-line |
| 11. Normal semester start | TBA |

B. Course Summary

This course describes the functions involved in preparing financial forecasts and projections. The students will study various tools and models to collect, consolidate information and make decision as sensible as possible on the basis of the available evidence. The course consists of 9 topics grouped within 4 modules. A detailed course overview is presented in Section F of this course guide.

B1. Course Topics

1. Introduction to business statistics & data collection
2. Organising and presenting data
3. Numerical descriptive measures
4. Probability theory
5. Normal curve and sampling distribution
6. Estimation
7. Hypothesis testing
8. Correlation and regression analysis
9. Time series and trend analysis

B2. A Note On Extensions

Modules 2 and 3 contain content extensions. If you intend to undertake studies in the Bachelor of Commerce Program it is advisable that you review and understand the content of these extensions. It is assumed that students undertaking degree level studies are proficient in the topic areas covered by the extensions.

C. Curriculum Base Of The Unit Of Competency

This course is made up of one unit from the Financial Services Training Package, FNBFIN70A Prepare financial forecasts and projections.

| Competency national code | Competency name | Prep/complete | Core/elective |
|--------------------------|---|---------------|---------------|
| FNBFIN70A | Prepare financial forecasts and projections | Complete | Core |

The Financial Services Training Package is available in RMIT library or on the website of the National Training Information Service: www.ntis.gov.au.

D. Course Outcomes

The following table outlines the elements of competency and performance criteria for the Unit of Competency FNBFIN70A Prepare financial forecasts and projections.

Elements of Competency and Performance Criteria

| |
|--|
| FNBFIN70A /01 Plan preparation table |
| Performance Criteria |
| <ul style="list-style-type: none">• All critical milestones are identified to ensure financial forecasts and projections can be prepared within timeframes.• Business plans are reviewed to identify timeframe parameters used.• Business plans, financial forecasting and processing systems are reviewed to identify all potential conflicts. |
| FNBFIN70A /02 Identify assumptions and parameters |
| Performance Criteria |
| <ul style="list-style-type: none">• Business plans and exception reports are reviewed to identify and resolve conflicts in assumptions.• Parameters are reviewed to ensure compliance with company policy and procedures.• Current and historical financial reports are examined to establish trends.• External environment is examined to gain objective overview. |
| FNBFIN70A /03 Issue instructions and relevant aids for preparation of forecasts and projections |
| Performance Criteria |
| <ul style="list-style-type: none">• Instructions issued are clear and unambiguous and comply with company format to ensure ease of use and consistency of interpretation.• Types of business are identified to enable effective models to be selected.• Training is provided to ensure comprehensive understanding and effective use of financial models by users. |

| |
|--|
| FNBFIN70A/04 Collect, consolidate, model and analyse data |
| Performance Criteria |
| <ul style="list-style-type: none"> • Data is reviewed to ensure consistency with actual results and model used. • Analysis results are documented in a clear and unambiguous way. • Data collected are reliable, valid, complete and comprehensive. • Processing is completed in accordance with established timetable. • Data are consolidated in a logical structured format that enables ready analysis. |
| FNBFIN70A /05 Document results and obtain approval |
| Performance Criteria |
| <ul style="list-style-type: none"> • Results are documented in a clear and understandable manner. • Documented results are in a format suited to meet needs of target users. • All approvals are obtained in accordance with management objectives, financial and company policies. • Results are distributed within timetable and according to company policy. |

E. Learning Activities And Elements Of Competency

This course will enable students to achieve the following learning outcomes

| Elements of Competency | Learning Activities & Underpinning Knowledge |
|--|--|
| Plan preparation timetable FNBFIN70A/01 Identify Assumptions and parameters FNBFIN70A/02 Issue instructions and relevant aids for preparation of forecasts and projection FNBFIN70A/03 | <p>Use measures of central tendency and dispersion to analyse the distribution of business data.</p> <ul style="list-style-type: none"> • Collection of data • Organise & present information using a range numerical and graphical procedures. • Calculate and argue the most appropriate measure/s for a given situation • Discuss the significance of skewness of a data distribution • Calculate and interpret measures of dispersion and the coefficient of variation in a business context <p>Apply probability concepts based on probability curves for identifying parameters and relevant aids for preparation of forecasts</p> <ul style="list-style-type: none"> • Learning the concepts of random variables and probability distribution • Applying the concepts using discrete & continuous probability distributions such as: Poison, binomial and normal probability distribution <p>Statistical Inference</p> <ul style="list-style-type: none"> • Distinguish between the population and a sample • Learning the basics of statistical inference: normal curve and sampling distributions • Estimating population parameters using confidence interval |

| | |
|---|--|
| Collect, consolidate, model and analyse data FNBFIN70A/04 | estimation Hypothesis Testing <ul style="list-style-type: none"> Identify and explain the role of hypothesis testing in business situations and explain the process of hypothesis testing Construct and test a hypothesis concerning the population mean using z, & t test. Modelling & Analysis <ul style="list-style-type: none"> Sketch a scatter diagram to illustrate the relationship between two business variables Calculate the coefficient of correlation to assess the strength of relationship between variables Determine the “line of best fit” by employing the least-squares linear regression model and using it for prediction Explain the limitations of correlation calculation and determine the reliability and strength of prediction Trend Analysis <ul style="list-style-type: none"> Describe a time series and explain its use in business. Identify the four kinds of variations in a time series: - secular trend, seasonal variation, cyclical variation and irregular variation Apply the following common methods of fitting secular trend lines to a business time series: least squares, semi-averages to arrive at an estimate of future activity & moving averages for smoothing a time series |
| Document results and obtain approval FNBFIN70A/05 | |

F Course Overview And Timelines

The course consists of 9 topics grouped within 4 modules. The following table provides an outline of the content and time allocation scheduled for each module.

| Module 1- Descriptive Measures Topics 1-3 | |
|--|--|
| Weeks 1 - 4 | Topic 1: Introduction to business statistics & data collection Topic 2: Organisation & visual representation of data Topic 3: Numerical descriptive measures This module introduces you to basic statistical terms, concepts and procedures. You will learn to prepare and organise data for graphical presentation. A variety of descriptive measures useful for exploring and characterising data are studied. Reading Levine, Chapter 1 - 3 |
| Module 2- Probability Distribution Topics 4-5 | |
| Weeks 5 - 7 | Topic 4: Probability theory and discrete probability distribution (Extension) Topic 5: Normal probability distribution & sampling distribution This module provides the basic knowledge needed to make inferences about the population based on samples. You will examine various discrete distributions and a close study of normal distribution. This module contains a <u>content extension</u> relating to Binomial & Poison Distribution. Reading |

| | |
|---|---|
| | Levine, Chapter 4 - 5 |
| Module 3- Statistical Inference Topics 6-7 | |
| Weeks 10 - 12 | <p>Topic 6: Estimation Topic 7: Hypothesis testing</p> <p>In this module you will learn to estimate the population parameters based on the sample using point estimation and interval estimation procedures. This also introduces hypothesis testing for drawing conclusion/making decisions about population based on sample statistics.</p> <p>This module also contains a content extension relating to sampling distributions and sample size determination.</p> <p>Reading Levine, Chapter 6 - 7</p> |
| | Assessment Task 1. Class Test covering topics 1 – 5 (Week 9) |
| Module 4- Modelling & Forecasting Topics 8-9 | |
| Weeks 13 - 15 | <p>Topic 8: Correlation and Regression Analysis Topic 9: Time series and trend analysis</p> <p>In this module you will examine the strength of association between variables and develop statistical model that can be used for prediction. You will examine historical data to establish trend. This module also introduces you, trend-fitting models used for forecasting.</p> <p>Reading Levine, Chapter 11 & 13</p> |
| | Assessment Task 2 – Research Assignment (covering topics 1 – 9) due in week 15 |
| | Final Examination - Covering Topics 1 – 9 |

G Assessment

Assessment map and schedule

| Activity | Generic capabilities being developed | When is it assessed? | Value |
|-------------------------|---|----------------------|-------|
| Group Assignment | <ul style="list-style-type: none"> Ability to use data and information to support positions and make and justify decisions Ability to reframe problem data sets, recognise problem types using analysis and model construction, apply solution approaches modelled in the course to new contexts with particular reference to quantitative data sets. Ability to use appropriate statistical tools and technology in analysis of business data and to interpret the results with an analysis of reliability. | Week 15 | 10% |

| | | | |
|--|---|---|-----|
| Closed book class test This will include a combination of short answer questions and case studies. | <ul style="list-style-type: none"> • Ability to use appropriate statistical tools and techniques in analysis of business data and to interpret the results with an analysis of reliability. • Ability to apply knowledge to well defined problems | Mid semester | 30% |
| Closed book exam This will include a combination of short answer questions and case studies. | <ul style="list-style-type: none"> • Ability to use data and information to support positions and make and justify decisions • Ability to reframe problem data sets, recognise problem types using analysis and model construction, apply solution approaches modelled in the course to new contexts with particular reference to quantitative data sets. • Ability to use appropriate statistical tools and techniques in the analysis of business data and to interpret the results with an analysis of reliability. | Final examination is held after topic 9 in the formal examination period. | 60% |

The above information is subject to variation.

G1. Assessment Grading

Graded results are used to acknowledge performance at an enhanced level and are given according to the following table:

| Description | Mark | Result | Range |
|----------------------------------|------|--------|---------|
| High distinction | HD | H | 80 -100 |
| Distinction | DI | D | 70 -79 |
| Credit | CR | C | 60 -69 |
| Pass | PA | P | 50 -59 |
| Pass (pass or fail courses only) | PX | P | |
| Fail | NN | N | < 50 |

H. Resources

H1 Recommended Reading

Prescribed text

David M. Levine, David Stephan, Timothy C.Krebiel & Mark L. Berenson, Statistics for Managers Using Microsoft Excel, third edition. Prentice-Hall International, Inc. ISBN:0-13-097082-4

Additional References

John S. Croucher, Statistics: Making Business Decisions. McGraw-Hill /Irwin.
ISBN:007471041-9

H2. Online Materials

Lecture notes, revision exercises and solutions to selected revision exercises quizzes and multimedia learning activities are available through your online learning resources

I. Graduate Capabilities And Key Competencies

The following table outlines graduate capabilities for students assessed as competent for this course:

| Graduate Capability | Learning Unit Application |
|---|--|
| Evidence based practice: <ul style="list-style-type: none">• Ability to use data and information to support positions and make and justify decisions.• Use a variety of IT & IS tools. | You will be developing these capabilities by completing Internet & tutorial exercises tasks. The class test will also have questions that require you to apply theories to solve problems. |
| Socially aware and responsible practice: <ul style="list-style-type: none">• Frame judgements and practice within professional, legal and ethical frameworks. | You will be developing these capabilities by developing and understanding of the ethical use of statistical measures and procedures. This capability will be developed in the Internet exercise tasks. |
| Information management/literacy <ul style="list-style-type: none">• Access information from a wide variety of sources and analyse its value and use. | Students will be able to capture statistical data from a variety of sources and use this data to prepare business reports in the learning team exercises and the class test. |
| Communicative capability <ul style="list-style-type: none">• Use communication skills to present business data. | Students will prepare reports (communicate results – quantitative, graphical, electronic) for a variety of decision-makers with varying information needs in a format that meets the users needs. |
| Problem solving and diagnosis: <ul style="list-style-type: none">• Apply knowledge to well defined problems. | The use of Internet exercises and tutorial exercises will assist students to apply statistical principles to real world examples and enable you to creatively and strategically solve business problems. |

Key Competencies

This course addresses the Key Competencies as follows:

| Key Competency | Course Application |
|--------------------------------------|--|
| Collecting, analysing and organising | Students will be applying this competency in the |

| | |
|---|---|
| information | development of their weekly tutorial questions and the assignment / project the results of which are presented in report form. |
| Planning and organising activities | Students will be applying this competency throughout the course in preparing and presenting all written work. This involves independent preparation for planned learning experiences. |
| Working with others and in teams | Students will be applying this competency in working with other students on group tutorial discussions. |
| Communicating ideas and information | Discussion of presented information through tutorials. Written communication of ideas via report writing, testing and feedback. |
| Using mathematical ideas and techniques | Students will be applying this competency throughout their studies for analysing and interpreting data. Applications and interpretations will include graphs. |
| Using Technology | Students will be applying this competency where appropriate by using: <ul style="list-style-type: none"> • the Internet to source information. • Microsoft Word to create documents. • Microsoft Excel as a means of analysing business data |
| Solving problems | Students will be applying this competency throughout their studies when answering tutorial questions, completing the assignment / project, test and exam. |

J. Course Requisites And Special Entry

What skills or qualifications do I need to have already to gain entry to this course?

There are no pre-requisites for this course.

K. Recognition And Credit Transfer

What is RPL/RCC/Credit Transfer?

Recognition of Prior Learning (RPL), Recognition of Current Competency (RCC) and Credit Transfer refer to recognition granted to work experience or life experience or academic studies completed in another course or program. This may include any combination of formal or informal training and education and formal credentials. Evidence of current skills and knowledge is matched against the competencies in the program for which recognition is being sought. A student granted credit for a course is not required to complete that course in order to qualify for the award.

How can I have my relevant previous study or experience recognised?

Complete an RCC/RPL or a Credit Transfer form. Attach the necessary documentation as evidence. Submit it to RMIT or if you are currently enrolled, submit

it to your Faculty Student Administration Officer. If you are enrolled, general information and the University's policy on Recognition of Prior Learning (RPL) and Credit Transfer can be accessed at <http://www.rmit.edu.au/course-admin/operating-procedures>.

L. Student Rights, Responsibilities And Support

What are my rights and responsibilities as a student at RMIT? What support services are available to help me?

RMIT provides a number of support services to students that are documented in the student diary and Student Administration Guide provided to all students at enrolment. The student diary also documents students' rights and responsibility as a student at RMIT.

University Plagiarism Statement

Students are reminded that cheating, whether by fabrication, falsification of data, or plagiarism, is an offence subject to University disciplinary procedures. Plagiarism in oral, written or visual presentations is the presentation of the work, idea or creation of another person, without appropriate referencing, as though it is one's own. Plagiarism is not acceptable. The use of another person's work or ideas must be acknowledged. Failure to do so may result in charges of academic misconduct, which carry a range of penalties including cancellation of results and exclusion from your course.

Students are responsible for ensuring that their work is kept in a secure place. It is also a disciplinary offence for students to allow their work to be plagiarised by another student.

Tests are held in normal class times throughout the semester. Students will be advised at the beginning of course the weeks in which assessment will be conducted. Tests are normally of 2 hours duration. Students are expected to attend for these assessments at the set times. If a student is unable to attend due to ill health, a medical certificate must be provided.



Part 2: Learning Guide

A. Planned Learning Experiences

For each topic, the student is provided with:

- Learning outcomes.
- A “start thinking” scenario to illustrate a practical context for the topic material
- Topic notes to be used as a printed document.
- Lecture overheads for class presentation. Note that there is no need to print these, as they duplicate content of the printed notes.
- An online glossary giving definition and an example of usage for key statistical terms.
- Learning activities including multimedia animations
- Multiple-choice questions.
- Sample questions and answers.
- Links to Internet sites.
- Recommended text references.

Students are expected to:

- Read topic notes containing topic content.
- Attend lectures and take notes.
- Read textbook reference or references where appropriate.
- Do online learning activities.
- Do sample questions and conduct self- assessment by accessing solutions

Study Organiser

| Week No. | Module | Topic / Activity |
|----------|----------|---|
| 1 | Module 1 | Introduction to Business Statistics and data collection |
| 2 | Module 1 | Organisation and visual representation of data |
| 3 | Module 1 | Numerical descriptive measures: central tendencies and use of Excel |
| 4 | Module 1 | Numerical descriptive measures: measures of variance and use of Excel |
| 5 | Module 2 | Probability theory and discrete probability distributions |
| 6 | Module 2 | Normal distribution |
| 7 | Module 2 | Sampling distributions and use of Excel |
| 8 | | Revision for class test |
| 9 | | Class Test (Module 1 and 2) Distribution of assignment |
| 10 | Module 3 | Estimation |
| 11 | Module 3 | Hypothesis testing |
| 12 | Module 3 | Hypothesis testing and use of Excel |
| 13 | Module 4 | Correlation |
| 14 | Module 4 | Linear regression and use of Excel |
| 15 | Module 4 | Time series and trend analysis and use of Excel Assignment due |
| 16 | | Revision for Exam |
| 17 | | Exam (All topics) |

Details of Module Content and Learning Activities

| | | |
|--|--|---|
| Module 1- Descriptive Measures (Weeks 1 to 4) Topic 1: Introduction to Business Statistics and Data Collection Topic 2: Organisation and Visual Representation of Data Topic 3: Numerical Descriptive Measures | | |
| Learning objectives | This module introduces basic statistical terms, concepts and procedures. You will learn to prepare and organise data for graphical presentation. A variety of descriptive measures useful for exploring and characterising data are studied. | |
| Learning activity | Learning outcomes | Resources |
| Students are required to: <ul style="list-style-type: none"> • Read topic notes containing topic content. • Attend lectures and take notes. • Read textbook reference or references where appropriate. • Do online learning activities prior to attending tutorials. • Do sample questions and conduct self-assessment by accessing solutions | At the end of this module students will be able to: <ul style="list-style-type: none"> • Collect data • Organise and present information using a range of numerical and graphical procedures. • Calculate and argue the most appropriate summary measure/s for a given situation • Discuss the significance of skewness of a data distribution • Calculate and interpret measures of location and dispersion and the coefficient of variation in a business context | Specific Online Learning resources: Topic 1: <ul style="list-style-type: none"> • Statistical thinking • Descriptive statistics – key terms • Sampling animation • Entering data into Excel demonstration • Using Excel Add-ins demonstration Topic 2: <ul style="list-style-type: none"> • Ordered arrays exercise • Frequency tables exercise • Histogram and Ogive example • Charts example for categorical data • Using Excel demonstration for categorical data • Using Excel demonstration for numerical data Topic 3 <ul style="list-style-type: none"> • Excel demonstration descriptive statistics • Interactive illustration: exploring descriptive measures. You should print the worksheet, then write your answers on the sheet as you explore the java applet. Textbook. Levine, Chapters 1 – 3 and relevant Excel activities |

Key points for learning

Topic 1

- Statistical thinking: for understanding, managing and reducing variation
- The difference between Descriptive Statistics and Inferential Statistics
- Data types and scales of measurement
- The difference between a Sample and a Population
- Sources of error in samples and surveys

Topic 2

- To be able to use the appropriate graphical display for the data type: scatter diagram, line graph, pie chart, bar chart, pareto diagram, histogram, ogive
- To be able to construct stem-and-leaf plots and obtain the 5 figure summary
- To understand the difference between frequency, relative frequency and cumulative frequency in tables and plots
- To use software to produce accurate and informative graphs

Topic 3

- Understand and be able to calculate measures of central tendency: mean, media, mode
- Understand and be able to calculate measures of spread: standard deviation, range, interquartile range
- Appreciate the effect of data outliers on the various descriptive statistics
- Describe the shape of a distribution of data
- Understand the difference between the formulae for variance of a population and variance of a sample
- Check the values calculated by software against a graph of the data to ensure accuracy
- Understand and calculate standard scores

Assessment reminders:

Students are required to select their groups for their assignment and communicate this information to the local course co-ordinator by the end of topic 3

**Module 2- Probability Distributions
(Weeks 5 to 7)**

Topic 4: Probability Theory and Discrete Probability distributions

Topic 5: Normal Probability Distribution and Sampling Distribution

| | | |
|--|--|---|
| Learning objectives | This module provides the basic knowledge needed to make inferences about the population based on samples. You will examine various discrete distributions such as the binomial and Poisson distribution and make a close study of the normal distribution. | |
| Learning activity | Learning outcomes | Resources |
| Students are required to: <ul style="list-style-type: none"> • Read topic notes containing topic content. • Attend lectures and take notes. • Read textbook reference or references where appropriate. • Do online learning activities prior to attending tutorials. • Do sample questions and conduct self-assessment by accessing solutions | At the end of this module students will be able to: <ul style="list-style-type: none"> • Define the concepts of random variables and probability distribution • Apply the concepts using discrete and continuous probability distributions such as Poisson, binomial and normal probability distribution • Distinguish between the population and a sample • Calculate probabilities using the sampling distribution of the mean | Specific Online Learning resources: Topic 4: <ul style="list-style-type: none"> • Excel demonstration generating values for binomial and Poisson distributions • Normal approximation to binomial applet. After exploring the applet to answer the questions on the screen you should click the link to see the answers. Topic 5: <ul style="list-style-type: none"> • Excel demonstration: finding normal probabilities and inverse normal calculations • Interactive illustration: central limit theorem. You should print the activity sheet and use it to write down the results of your exploration. • Animated illustration of using normal tables Textbook. Levine, Chapters 4.1, 4.2, 4.4, 4.6, 4.7, 4.9, 5.1, 5.4, 5.6 and relevant Excel activities |

Key points for learning

Topic 4

- Methods of calculating probabilities
- Rules for probabilities: addition rule, conditional probability, multiplication rule
- The concept of independent events
- The concept of mutually exclusive events
- Calculating mean and variance for discrete probability distributions
- The Binomial distribution: counting the number of successes out of n independent trials with probability of success p
- Using the formula to calculate Binomial probabilities
- Using the formula to find mean and variance of a Binomial distribution
- The Poisson distribution: counting the number of events when you know the average number of random occurrences in a given interval of time, length, space, etc
- Using the formula to calculate Poisson probabilities
- Using the formula to find mean and variance of a Poisson distribution

Note that this entire topic consists of extension material

If you intend to undertake studies in the Bachelor of Commerce Program it is advisable that you review and understand this content. It is assumed that students undertaking degree level studies are proficient in the topic areas covered by the extensions.

Topic 5

- Normal distribution, Z scores
- Calculating probabilities and inverse probabilities for a Normal random variable.
- The sample mean is a random variable with its own distribution: “the sampling distribution of the mean”.
- The “standard error” is the standard deviation of the sampling distribution of the mean. It equals the population standard deviation divided by the square root of the sample size.
- If the population distribution is Normal, then the sampling distribution of the mean will also be Normal.
- For any population distribution, the sampling distribution of the mean approaches the Normal distribution as the sample size increases. For $n > 30$, the approximation is good.
- T-distribution: similar to Normal, but fatter tails.
- If the population standard deviation is unknown, use the sample standard deviation, but then the sampling distribution of the mean is the t distribution with $n-1$ degrees of freedom.
- The sample proportion X/n is approximately Normally distributed, with mean p and standard error the square root of $p(1-p)/n$.

Assessment reminders:

You should be revising for the test on modules 1 and 2 to be held in week 9. The lecture activities, online learning activities, sample questions and multiple-choice questions covered for the first 5 topics are the indicator of the structure and content of the test and the standard required of the knowledge and skills to be assessed.

The assignment will be distributed at the end of week 9. Students should begin to collect the required data and start with analysing data using excel and PHStat.

**Module 3- - Statistical Inference
(Weeks 10 to 12)**

Topic 6: Estimation

Topic 7: Hypothesis Testing

| | | |
|--|---|---|
| Learning objectives | In this module you will learn to estimate the population parameters based on the sample using point estimation and interval estimation procedures. This also introduces hypothesis testing for drawing conclusions / making decisions about a population based on sample statistics. This module also discusses determination of sample size. | |
| Learning activity | Learning outcomes | Resources |
| Students are required to: <ul style="list-style-type: none"> • Read topic notes containing topic content. • Attend lectures and take notes. • Read textbook reference or references where appropriate. • Do online learning activities prior to attending tutorials. • Do sample questions and conduct self-assessment by accessing solutions | At the end of this module students will be able to: <ul style="list-style-type: none"> • Estimate population parameters using confidence Interval estimation • Identify and explain the role of hypothesis testing in business situations and explain the process of hypothesis testing, • Construct and test a hypothesis concerning the population mean using z, and t test. | Specific Online Learning resources: Topic 6: <ul style="list-style-type: none"> • Excel demonstration: finding a confidences interval • Interactive illustration: confidence intervals. After exploring the applet to answer the questions on the screen students should click the link to see the answers. Topic 7: <ul style="list-style-type: none"> • Types of error drag and drop exercise • Steps in hypothesis testing exercises. Select the correct option at each step of the process. An explanation is given when the correct selection is made. At each stage you can refer to the steps taken so far. • Excel demonstrations showing the calculations for the two examples used in the decision steps exercises. Textbook. Levine, Chapters 6.1 - 6.4, 6.6, 7.1 - 7.4, 7.6 and relevant Excel activities |

Key points for learning

Topic 6

- Revise concept of sampling distribution of the mean
- Finding confidence intervals for the population mean when variance is known, using Z distribution
- Finding confidence intervals for the population mean when variance is not known, using t distribution
- Finding confidence intervals for a proportion
- Calculating required sample size to give a specified maximum standard error

Note that this topic contains some extension material

The calculation of sample size for specified standard error is an extension to the course.

If you intend to undertake studies in the Bachelor of Commerce Program it is advisable that you review and understand this content. It is assumed that students undertaking degree level studies are proficient in the topic areas covered by the extensions.

Topic 7

- Concept of hypothesis testing: the six step process
- Type I and Type II errors
- One tail and two tail tests
- Level of significance: how to decide when to reject the null hypothesis
- Interpretation of p values from Excel output
- Use a Z test if population standard deviation is known; t-test if population standard deviation is not known

Assessment reminders:

Students should have completed the first part of the assignment by the end of week 12.

| | | |
|--|---|--|
| Module 4- - Modelling and Forecasting (Weeks 13 to 15) Topic 8: Correlation and Regression Analysis Topic 9: Time series and trend analysis | | |
| Learning objectives | In this module you will examine the strength of association between variables and develop statistical model that can be used for prediction. You will examine historical data to establish trend. This module also introduces you to trend-fitting models used for forecasting. | |
| Learning activity | Learning outcomes | Resources |
| Students are required to: <ul style="list-style-type: none"> • Read topic notes containing topic content. • Attend lectures and take notes. • Read textbook reference or references where appropriate. • Do online learning activities prior to attending tutorials. • Do sample questions and conduct self-assessment by accessing solutions | At the end of this module students will be able to: <ul style="list-style-type: none"> • Sketch a scatter diagram to illustrate the relationship between two business variables • Calculate the coefficient of correlation to assess the strength of relationship between variables • Determine the “line of best fit” by employing the least-squares linear regression model and use it for prediction • Explain the limitations of correlation calculation and determine the reliability and strength of prediction • Describe a time series and explain its use in business Identifying the four kinds of variations in a time series:- secular trend, seasonal variation, cyclical variation and irregular variation 1. Apply the following common methods of fitting secular trend lines to a business time series: least squares, semi-averages, to arrive at an estimate of future activity and moving averages for smoothing a time-series | Specific Online Learning resources: Topic 8: <ul style="list-style-type: none"> • Interactive illustration: restriction of range applet. After exploring the applet to answer the questions on the screen you should click the link to see the answers. • Excel demonstration showing the steps in using Excel to answer a typical regression analysis question Topic 9: <ul style="list-style-type: none"> • Excel demonstration: smoothing time series using moving averages • Steps in identifying time series components exercise. Select the correct option at each step of the process. An explanation is given when the correct selection is made. At each stage the you can refer to the steps taken so far. Textbook. Levine, Chapters 11.1 - 11.4, 11.7, 11.9, 11.10, 13.1, 13.2, 13.3 (except exponential smoothing), 13.4 (only linear model) and relevant Excel activities |

Key points for learning

Topic 8

- Dependent variable and independent variable
- Scatter plot
- Linear model: finding the least squares line of best fit
- Interpreting the estimates for intercept and slope
- Using the regression equation for prediction
- Calculate and interpret the coefficient of determination

Topic 9

- Recognise time series data
- Identify components of time series
- Use moving average to smooth series
- Use semi-averages of linear regression to fit a trend line

Assessment reminders:

The assignment is due after topic 9 in week 15. Students should start preparing for the exam by the end of topic 9 and be ready for the revision in week 16.

B – Assessment

To receive a pass for this course a student must:

- Pass the final Exam and
- Achieve at least 50% overall.

General presentation of written work

Some general comments can be made about the standard of all written work to be submitted. These standards serve two purposes. First, in actual employment you are required to comply with formats and standards specified by your employer and formal written work gives you some practice in this. Second, the layout specified facilitates marking and the provision of feedback.

Assignments must be typed, and be double-spaced, one side only of A4 paper and with a left hand margin at least three centimetres in width. Submitted work must be originals. Photocopies are not acceptable for assessment and will be returned unmarked.

All data Analysis for your assignment must be done using Microsoft Excel. A soft copy of your data analysis must be attached with your assignment

A copy of submitted work must be retained by students.

See the course guide section above for more details of assessment

C - Supplementary Information for Enrolled Students

Student feedback and evaluation

- Students should inform their facilitator about any assessment and content issues throughout their study.
- Students should use of email queries and online discussion tools whenever possible to gain feedback.
- Students should be willing to provide their facilitator with feedback when requested, in regards to learning activities, access to resources, structure of online course (ease of use, functionality), and key components.
- A student feedback survey/questionnaire will be available toward the end of semester.