FOUN014 Health and Disease

Section 1: General Information

1.1 Administrative Details

Subject:	Health and Disease
Code:	014
Stream	Health Science and Life Science
Points	12
Pre-requisite	none

1.2 Subject Workload

Number of timetabled hours per week	Number of Personal study hours per week	Total workload hours per week
4	4	8

1.3 Pre-requisites

Students are not required to have undertaken a pre-requisite subject.

1.4 Other resource requirements

List specialist facilities and/or equipment required for the delivery of this subject:

Use of computer suite

Section 2: Academic Details

2.1 Subject Overview

The aim of this paper is to provide students with the necessary knowledge and skills to successfully study microbiology and epidemiology at undergraduate university level. It includes the computing skills required by health science students for successful university study.

2.2 Learning Objectives and Outcomes

By the end of this paper, students should be able to:

1. Define health, health related events and public health and be able to describe examples illustrating these concepts.
2. Define disease, communicable and non- communicable diseases, and be able to describe examples of both.
3. Describe the features of bacteria and viruses.
4. Describe public health interventions to prevent and control communicable diseases.
5. Define epidemiology, measure health related events and associations, describe and interpret the results of an epidemiological study and use the language of epidemiology appropriately.
6. Carry out assignments on contemporary issues in health by critically reading literature, extracting relevant data and interpreting this in context.
7. Research, present and discuss case studies using computer applications, both within a group and as an individual. This will include the collection, analysis and communication of health information.
8. The computing section of FOUN014

   This part of the paper has two underlying aims:
1. To support and reinforce lectures and tutorials
2. To provide students with an "IT Toolkit" of skills and knowledge that will be useful whatever course of later study is followed.
   - IT resources available at the University of Otago
   - Using the Internet for academic research
   - Using resources available via the University Library web site
   - Using applications such as word processing, spreadsheets, and presentation software

Public Health surveillance provides mountains of data on the health of people within its community. The goals of this component of FOUN014 Health and Disease is for students to be able to access aspects of this data from the World Wide Web, to be able to present the relevant data as a long document, as excel spreadsheet or graph and as a written report.

2.3 Subject Content

Lecture One: - What is Health?
Student Outcomes
At the end of this lecture, tutorial and research topic the successful student should be able to:
1. Understand and communicate the concept of health and wellbeing.
2. Define and give examples of public health and public health interventions.
3. Describe aspects of wellbeing used to measure health.
4. Define epidemiology and describe the components of the definition.
5. Describe the concepts of vaccination (immunization) and herd immunity.
6. Describe examples of immunization carried out to protect children in New Zealand.

Lecture Two: - Disease
Student Outcomes
At the end of this lecture, tutorial and research topics the successful student should be able to:
1. Define the terms disease, health related event, infection, pathogen, host, reservoir, carrier, pathogenicity and virulence factor.
2. Describe and give examples of communicable and non communicable diseases.
3. Describe the stages of the natural history of disease progression.
4. Describe the significance and give examples of risk factors (eg. predisposed factors) in disease.
5. Describe the parts of the ecological model (triangle) of disease and describe this relationship for at least two diseases.
6. Describe the portals of entry and the methods of transmission for communicable diseases.
7. Define reproductive rate (Ro) and give examples.
8. Describe the relationship of parasitism with advantages and disadvantages for the parasite and the host.
9. Use influenza as an example of a viral infection.

Lecture Three: - What is a virus?
Student Outcomes
At the end of this lecture the successful student should be able to:
1. Define the term virus.
2. Describe the characteristics of viruses in terms of size, structural features, and host range.
3. Describe viral structures and label these structures on a diagram.
4. Describe at least three features by which viruses are classified.
5. Describe the effects of viral infection on host cells.
6. Describe the steps of the lytic replication cycle of a virus.
7. Describe the lysogenic replication cycle.

Lecture Four: - Introduction to Bacteria
Student Outcomes:
At the end of this lecture, tutorial and research topics the successful student should be able to:
1. Define microbiology and name the types of organisms studied.
2. Describe prokaryotic cell structure, their common features and be able to label a prokaryotic cell.
3. Give examples of bacterial virulence factors.
4. Describe two mechanisms by which bacteria cause disease and give examples of diseases caused by each.
5. Describe how antibiotics affect the bacterial cell.

6. Define the term microbiota (normal flora) and state where the microbiota is found on and in the human body
7. Describe at least two benefits for human health of the microbiota.
8. Use cholera as an example of a disease caused by a bacterium.

Lecture Five: - Non Communicable Diseases (NCD)
Student Outcomes
At the end of this lecture the successful student should be able to:
1. Define and give at least four examples of non - communicable diseases.
2. Define the term risk factor and give examples.
3. Explain the importance of risk factors in non - communicable diseases.
4. Describe examples of primary, secondary and tertiary prevention.
5. Describe purpose and examples of screening procedures.
6. Describe Alzheimer's disease and cancer as examples of non - communicable disease.

Lecture Six - Cancer
Student Outcomes
The student learning outcomes for the Cancer MOOC in the lab book are:
1. Define cancer in a sentence
2. Give examples of cancer common to women and men
3. Define the terms tumour and neoplasia
4. Describe the characteristics of benign and malignant tumours
5. Define these important terms when describing cancer: transformation, dysplasia, anaplasia, autonomy, angiogenesis
6. State the 3 main causes of transformation
7. Distinguish between primary and secondary sites of cancer
8. State the two routes by which cancer cells can spread to other organs
9. Name cancers of the epithelial and lymph tissue
10. Answer the question "What is metastasis?"
11. Describe the stages of cancer
12. Describe the three main methods of treatment for cancer
13. Describe statistics for cancer deaths in New Zealand (2011) in terms of leading cancer causes of death overall, in the 0-24 years age group and in Maori / non Maori ethnic groups.

Lecture Seven – Descriptive Epidemiology
Student Outcomes
At the end of this lecture and tutorial the successful student should be able to:

1. Explain the difference between descriptive and analytical epidemiology.
2. Describe the distribution of disease in a population according to person, place and time.
3. Describe the benefits of public health surveillance.
4. Describe sources of information for surveillance.
5. Distinguish between passive, active and sentinel surveillance.

Lecture Eight – Measurement of Disease
Student Outcomes
At the end of this lecture and tutorial the successful student should be able to:

1. Explain what counts, ratios, proportions and rates are.
2. Define, calculate and interpret cumulative incidence and incidence rate.
3. Define, calculate and interpret prevalence.

4. Describe the relationship between cumulative incidence and prevalence.
5. Calculate person years
6. Calculate crude mortality, cause specific mortality, age specific mortality, case fatality, and crude birth rate.

Lecture Nine – Comparing Exposure and Outcome
Student Outcomes
At the end of this lecture and tutorial the student should be able to:

1. Distinguish the exposure and outcome involved in an association
2. Interpret and calculate the measures of association of attributable risk percentage, odds ratio and relative risk.

Lecture Ten: – Outbreaks, Epidemics, Pandemics and Endemics.
Student Outcomes
At the end of this lecture and tutorial the successful student should be able to

1. Explain the meaning and differences among the terms epidemic, endemic, disease outbreak and cluster.
2. Interpret epidemic curves for information on type of epidemic and possible time of exposure.
3. Describe the steps involved in outbreak investigation.
4. Use incidence (attack rate) and relative risk to identify possible causes of an epidemic or outbreak.

Lecture Eleven: - Epidemiology Study Methods
Student Outcomes
At the end of this lecture the student should be able to:

1. Define analytical epidemiology.
2. Describe the use of hypothesis testing in scientific method.
3. Distinguish between exposure and outcome.
4. Explain differences between observational and experimental studies.
5. Describe the basic study designs of an ecological study, cross sectional study, a cohort study, a case – control study and a randomized control trial.
6. Describe advantages and weaknesses of the case control, cohort and randomized controlled trial studies.

Computing Laboratories

Lab 1 and 2 - Information Literacy
Produce clear and coherent documents from which the research, development, organisation and style are appropriate and relevant to task, purpose and audience.

Learning Outcomes
Students should be able to: Use technology to assist with research:
- Access University of Otago computing resources
- Referencing electronic resources such as Zotero, BibMe
- Develop and produce documentation using appropriate application software:
- File management using Windows Explorer
- Apply good Ergonomic practice when working at a computer

Lab 3 - Zotero [zoh-TAIR-oh]
At the completion of this section students should be able to:
- Understand what the application Zotero can do for your work processes
- Download Zotero connector
- Download citations using two different methods

Lab 4 – Text Processing
At the completion of this Lab students should be able to:
- Navigate the Microsoft Word environment confidently
- Create and develop a new document
- Work with an existing document
- Apply basic formatting features to enhance the readability of a document

Lab 5 – Text Processing
At the completion of this Lab students should be able to:
- Apply suitable page layout features to assist with the readability of a long document
- Insert tables to assist with the readability of columnar data
- Use styles to efficiently apply a consistent look across a document
- Apply appropriate references where applicable

Lab 6 – MOOC on Cancer
At the completion of this Lab students should be able to:
- Define cancer in a sentence
- Give examples of cancer common to women and men
- Define the terms tumour and neoplasia
- Describe the characteristics of benign and malignant tumours
- Define these important terms when describing cancer: transformation, dysplasia, anaplasia, autonomy, angiogenesis
- State the 3 main causes of transformation
- Distinguish between primary and secondary sites of cancer
- State the two routes by which cancer cells can spread to other organs
- Name cancers of the epithelial and lymph tissue
- Answer the question "What is metastasis?"
- Describe the stages of cancer
- Describe the three main methods of treatment for cancer
- Describe statistics for cancer deaths in New Zealand (2011) in terms of leading cancer causes of death overall, in the 0-24 years age group and Maori / non Maori

Lab 7 - Spreadsheets
In this Lab
- Introduction to spreadsheets – Microsoft Excel
- Formatting
- Printing
- Autofill
- Formulas
- Functions
- Sorting and subtotals
- Charts

Lab 8 - Spreadsheets
In this Lab
- Types of data
- Appropriate analysis & formula

Lab 9 – PowerPoint
In this Lab you will be developing the following skills:
- Using PowerPoint
- Creating a simple and effective presentation

Labs 10 and 11 Group Work Assignment
- Students are required to attend these labs, and work on their group research and presentation assignment.
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- This is the opportunity for specialised help from the computing teacher.

2.4 Teaching Method/Strategies

Lectures with lecture slides available on blackboard after lectures, small class tutorials where students can work independently, or in pairs and small groups to tackle practise questions and develop their knowledge and understanding of the course content. This is a time where individuals can seek individual help from the tutor. Consultations provide an additional time for individual help.
The computer laboratory sessions are used to introduce and for students to develop the computing skills covered in the learning objectives.

2.5 Assessment

Assessment Type	When	Weighting	Learning Outcomes Assessed
Internal Mid Term test	Week 7	15%	Covers the first 5 lectures
Computing	Week 5 , 6 and 9	10%	All the computing outcomes
Group Assignment	Week 12	15%	
Final Examination	Week 13	60%	All theory lectures

2.5.1 Assessment Strategy

2.5.2 Hurdle Requirement
In order to pass this paper, students must obtain an overall mark of 50% (C-) or better.

2.5.3 Assessment Details

Assessment	Content/ Format	Time	Details
Internal Assessment Mid Term test	25 multichoice and 25 short answer marks	45 minutes	Outcomes of the first five lectures
Internal Assessment Computing	Word Processing assignment	5%	Covering labs 2 and 3
	Cancer Exit test	2%	Covering lab 6
	Spread sheet assignment	3%	Covering lab 7 and 8
Internal Assessment Group Assignment	A written report plus a class presentation researching a health related event	15%	Uses the computing outcomes plus the theory based outcomes
Final Examination		2 hours	Learning outcomes form lectures 1-11

2.6 Prescribed and Recommended Reading

Prescribed Text:
Produced Foundation Year Health and Disease workbooks and theory and computing

Recommended Reading:
A recommended You tube viewing list is provided.
Websites:
Numerous websites are listed for researching throughout the computing book.

3 Weekly Schedule

Week	Lecture	Tutorial	Laboratory
1	What is health?	Examples of Public Health The Plague Orders Immunisation Health and Wellbeing Questionnaire	Online Resources Copyright, information and referencing
2	Disease	**Case Study** Influenza Infection	Library databases Referencing - Zotero
3	Introduction to viruses	What is a virus?	Library databases Referencing - Zotero
4	Introduction to bacteria	What is a bacterium? Cholera	Text Processing
5	Non Communicable diseases	Comparison of NZ and Ethiopia data Prevention Test for Alzheimer's	Text Processing
6	Theory Test (15%)	Test Results Introduction to Group Assignment	MOOC on Cancer
7	Descriptive Epidemiology	Interpretation of Epidemiological Data	Spreadsheets
8	Measurement of Health Related Events	Calculation of epidemiological data	Spreadsheets
9	Comparing Exposure and Outcome	Measurement of Association	Powerpoint
10	Outbreaks, Epidemics and Pandemics	Investigation of an outbreak	Assignment group work
11	Epidemiology Study Methods	Significant Examples of Epidemiological Studies	Assignment group work
12	Paper Review	Presentations of assignment group work	Presentations of assignment group work