

# BIOS5801: STATISTICAL COMPUTING

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## Effective Term

Semester A 2025/26

## Part I Course Overview

### Course Title

Statistical Computing

### Subject Code

BIOS - Biostatistics

### Course Number

5801

### Academic Unit

Biostatistics (BIOS)

### College/School

College of Computing (CC)

### Course Duration

One Semester

### Credit Units

3

### Level

P5, P6 - Postgraduate Degree

### Medium of Instruction

English

### Medium of Assessment

English

### Prerequisites

Nil

### Precursors

Nil

### Equivalent Courses

Nil

### Exclusive Courses

Nil

## Part II Course Details

### Abstract

Contemporary biostatistics and data analysis depend on a mastery of tools for computation, visualization, dissemination, and reproducibility, in addition to proficiency in traditional statistical techniques. The goal of this course is to provide

training in the elements of a complete pipeline for data analysis using R. It is targeted to students with some data analysis experience.

### Course Intended Learning Outcomes (CILOs)

CILOs	Weighting (if app.)	DEC-A1	DEC-A2	DEC-A3
1 Understand the importance of visualization, dissemination and reproducibility in data analysis	40	x	x	
2 Ability to provide a complete pipeline for data analysis using R	40	x	x	x
3 Appreciate the relevance of statistical computing for applications in public health	20	x	x	x

#### A1: Attitude

Develop an attitude of discovery/innovation/creativity, as demonstrated by students possessing a strong sense of curiosity, asking questions actively, challenging assumptions or engaging in inquiry together with teachers.

#### A2: Ability

Develop the ability/skill needed to discover/innovate/create, as demonstrated by students possessing critical thinking skills to assess ideas, acquiring research skills, synthesizing knowledge across disciplines or applying academic knowledge to real-life problems.

#### A3: Accomplishments

Demonstrate accomplishment of discovery/innovation/creativity through producing /constructing creative works/new artefacts, effective solutions to real-life problems or new processes.

### Learning and Teaching Activities (LTAs)

LTAs	Brief Description	CILO No.	Hours/week (if applicable)
1 Teaching	Learning through teaching based on lectures	1, 2, 3	3 hours/ week
2 Assignments	Learning through assignments allows students to develop hands-on skills involving data analysis using R	1, 2, 3	

### Assessment Tasks / Activities (ATs)

ATs	CILO No.	Weighting (%)	Remarks ("- " for nil entry)	Allow Use of GenAI?
1 Assignments	1, 2, 3	30	-	Yes
2 Project	1, 2, 3	30	-	No

#### Continuous Assessment (%)

60

#### Examination (%)

40

#### Examination Duration (Hours)

2

**Minimum Continuous Assessment Passing Requirement (%)**

40

**Minimum Examination Passing Requirement (%)**

35

**Additional Information for ATs**

To pass the course, students are required to obtain a minimum of 40% in continuous assessment and a minimum of 35% in the examination.

**Assessment Rubrics (AR)**

**Assessment Task**

Assignments (for students admitted before Semester A 2022/23 and in Semester A 2024/25 & thereafter)

**Criterion**

Problem solving skills

**Excellent**

(A+, A, A-) Consistently demonstrates a thorough understanding of data analysis and strong ability to solve problems using R

**Good**

(B+, B, B-) Adequately demonstrates an understanding of data analysis using R and ability to solve problems using R

**Fair**

(C+, C, C-) Demonstrates some understanding of data analysis by using R to solve simple problems

**Marginal**

(D) Demonstrates some understanding of data analysis but cannot apply R to solve simple problems

**Failure**

(F) Demonstrates little understanding of data analysis using R and is unable to apply them to problems

**Assessment Task**

Project (for students admitted before Semester A 2022/23 and in Semester A 2024/25 & thereafter)

**Criterion**

Problem solving based on comprehensive understanding

**Excellent**

(A+, A, A-) Demonstrates a comprehensive understanding of data analysis and strong ability in applying R to solve relevant problems in public health

**Good**

(B+, B, B-) Adequately demonstrates an understanding of data analysis and ability in applying R to solve relevant problems in public health

**Fair**

(C+, C, C-) Demonstrates some understanding of data analysis and little ability to solve simple problems with limited success

**Marginal**

(D) Demonstrates some understanding of data analysis but cannot apply R to solve simple problems

**Failure**

(F) Inappropriately or unable to apply data analysis using R to solve problems

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**Assessment Task**

Examination (for students admitted before Semester A 2022/23 and in Semester A 2024/25 & thereafter)

**Criterion**

Problem solving based on comprehensive understanding

**Excellent**

(A+, A, A-) Consistently demonstrates a comprehensive understanding of data analysis and strong ability in applying relevant functions in R to solve complex problems in public health

**Good**

(B+, B, B-) Adequately demonstrates an understanding of data analysis and ability in applying relevant functions in R to solve complex problems in public health

**Fair**

(C+, C, C-) Demonstrates some understanding of data analysis and ability in using R to solve simple problems

**Marginal**

(D) Demonstrates some understanding of data analysis using R and limited ability in using R to solve simple problems

**Failure**

(F) Demonstrates little understanding of data analysis using R and is unable to apply them to problems

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**Assessment Task**

Assignment (for students admitted from Semester A 2022/23 to Summer Term 2024)

**Criterion**

Problem solving skills

**Excellent**

(A+, A, A-) Consistently demonstrates a thorough understanding of data analysis and strong ability to solve problems using R

**Good**

(B+, B) Adequately demonstrates an understanding of data analysis using R and ability to solve problems using R

**Marginal**

(B-, C+, C) Demonstrates some understanding of data analysis by using R to solve simple problems

**Failure**

(F) Demonstrates little understanding of data analysis using R and is unable to apply them to problems

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**Assessment Task**

Project (for students admitted from Semester A 2022/23 to Summer Term 2024)

**Criterion**

Problem solving based on comprehensive understanding

**Excellent**

(A+, A, A-) Demonstrates a comprehensive understanding of data analysis and strong ability in applying R to solve relevant problems in public health

**Good**

(B+, B) Adequately demonstrates an understanding of data analysis and ability in applying R to solve relevant problems in public health

**Marginal**

(B-, C+, C) Demonstrates some understanding of data analysis and little ability to solve simple problems with limited success

**Failure**

(F) Inappropriately or unable to apply data analysis using R to solve problems

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**Assessment Task**

Examination (for students admitted from Semester A 2022/23 to Summer Term 2024)

**Criterion**

Problem solving based on comprehensive understanding

**Excellent**

(A+, A, A-) Consistently demonstrates a comprehensive understanding of data analysis and strong ability in applying relevant functions in R to solve complex problems in public health

**Good**

(B+, B) Adequately demonstrates an understanding of data analysis and ability in applying relevant functions in R to solve complex problems in public health

**Marginal**

(B-, C+, C) Demonstrates some understanding of data analysis and ability in using R to solve simple problems

**Failure**

(F) Demonstrates little understanding of data analysis using R and is unable to apply them to problems

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## Part III Other Information

**Keyword Syllabus**

Visualization, dissemination and reproducibility for data analysis using R.

**Reading List**

**Compulsory Readings**

Title	
1	R for Data Science: Import, Tidy, Transform, Visualize, and Model Data by Hadley Wickham and Garrett Golemund

**Additional Readings**

<b>Title</b>	
1	Nil