

## BDE 212 Statistics and Other Tools for Biologists

### Short description of the module

#### BDE 212 Statistics and Other Tools for Biologists

This module is a thorough introduction to the key numerical skills and processes underpinning the good practice of biological sciences. It covers experimental design, statistical analyses, the concept of null and alternative hypotheses, data handling and logical interpretation, data presentation and scientific communication, advanced use of Microsoft Excel, PowerPoint and R Statistical Computing free software. Hands-on statistical exercises cover a range of descriptive statistics, parametric and non-parametric analyses, basic data manipulation, plots, linear regression and analysis of variance. Applied scientific investigatory principles to biology are explored using experimental planning (controls, replication, randomisation), ethics, scientific and popular publication processes, and the use of scientific literature.

## BDE 212 Statistiek en Ander Instrumente vir Bioloë

### Kort beskrywing van die module

#### BDE 212 Statistiek en Ander Instrumente vir Bioloë

Hierdie module is 'n deeglike inleiding tot die sleutel numeriese vaardighede en prosesse onderliggend aan goeie praktyk in die biologiese wetenskappe. Dit dek eksperimentele ontwerp, statistiese analises, die konsepte van nul- en alternatiewe hipoteses, die hantering en logiese interpretasie van data, data-aanbieding en wetenskaplike kommunikasie, die gevorderde gebruik van Microsoft Excel, PowerPoint en kostevrye R Statistiese Berekeningsagteware. Praktykgerigte statistiese oefeninge dek 'n reeks van beskrywende statistiek, parametriese analises, nie-parametriese analises, basiese data-manipulering, stippings, lineêre regressie en analise van variansie. Toegepaste wetenskaplike ondersoekbeginsels in die biologie word ondersoek deur gebruik te maak van eksperimentele beplanning (kontroles, replisering, ewekansigmaking), etiek, wetenskaplike en populêre publikasieprosesse, en die gebruik van wetenskaplike literatuur.

## Module summary

Name	BDE 212 Statistics and Other Tools for Biologists
Duration	1 <sup>st</sup> semester
Type	
Academic commitment*	16 credits = 160 notional hours
Scheduled learning opportunities	3 Lectures per week 1 practical per week
Assessment option	Option 6
Language option	Option 3
Mode of offering	Face-2-Face
Corequisites / Prerequisites / Pass prerequisites**	Science in context 178 or Computer skills 171

\*Notional hours are the learning time that it would take an average learner to meet the outcomes of the module.

\*\*The onus is on the students to ensure that they meet the prerequisites of the module.

## Module-oorsig

Naam	BDE 212 Statistiek en Ander Instrumente vir Bioloë
Duur	1 <sup>ste</sup> semester
Tipe	
Akademiese verbintenis*	16 krediete = 160 veronderstelde ure
Geskeduleerde leergleenthede	
Assesseringsoptie	Opsie 6
Taalopsie	Opsie 3
Modus van aanbieding	In persoon
Newevereistes / Voorvereistes / Slaagvoorvereistes**	Wetenskap in Konteks 178 of Rekenaarvaardigheid 171

\*Veronderstelde leerure is die tyd wat die gemiddelde leerder aan die module sal moet spandeer om aan die uitkomste van die module te voldoen.

\*\*Die onus rus op die studente om te verseker dat hulle aan die voorvereistes van die module voldoen.

## Outcomes

This course aims to introduce you to the nature of science, and how science is done by properly designing a study and analysing your data. It also gives you generic skills in data presentation and writing that you can apply as undergraduates and as postgraduates in your chosen direction.

Doing Science: on completion of this component of the course, you should understand the following about the practise of science, and be able to apply it to biology:

- » Searching the literature
- » The publication process
- » Ethics of publication and research
- » The interface between science and the public through popular science
- » Use of Microsoft PowerPoint for data presentation for both written presentations and verbal seminars
- » Experimental design, replication, pseudoreplication

Data Analyses: this large section includes the exploration of the scientific method and hypothesis testing, parametric and nonparametric statistics, comparisons between two or more groups of values using analysis of variance-based techniques, and correlation and regression. By the end of the module, you should be able to do the following with your own data sets:

- » identify different data types;
- » set up null and alternative hypotheses;
- » use Microsoft Excel for data entering and handling;
- » use of R free software: the R Project for Statistical Computing (<https://www.r-project.org>) and R Studio for statistical analyses;
- » exploration of data (tables and plots): e.g. histograms, density plots, scatter plots, boxplots;
- » describe data statistically using means, medians, standard deviations, and ranges;
- » assess whether or not data are normally distributed;
- » choose and perform the appropriate statistical tests to:
  - compare a single variable between two, three or more groups using *t*-tests and ANOVAs or their non-parametric equivalents,

## Uitkomste

Hierdie kursus mik om jou bekend te stel aan die aard van wetenskap en hoe dit beoefen word deur die deeglike beplanning van 'n studie en die analise van jou data. Dit verskaf ook aan jou generiese vaardighede in data-aanbieding en skryfwerk wat jy sal kan toepas as 'n voorgraadse en nagraadse student in jou gekose veld van studie.

Wetenskapsbeoefening: na voltooiing van hierdie komponent van die kursus, behoort jy die volgende te verstaan rakende die beoefening van wetenskap, en dit te kan toepas binne biologie:

- » Soek na literatuur
- » Die publikasie proses
- » Etiek van publikasie en navorsing
- » Die koppelvlak tussen wetenskap en die publiek deur populêre wetenskap
- » Die gebruik van Microsoft PowerPoint vir data aanbieding vir beide geskrewe en verbale seminare
- » Eksperimentele ontwerp, replikasie en pseudo-replikasie.

Data analyse: hierdie groot afdeling sluit in die verkenning van die wetenskaplike metode en hipotese toetsing, parametriese en nie- parametriese statistiek, vergelykings tussen twee of meer groepe waardes deur van variansie-gebaseerde tegnieke gebruik te maak, en korrelasie en regressie. Aan die einde van die module behoort jy in staat te wees om die volgende met jou eie datastel te doen,

- » identifiseer verskillende tipes data;
- » 'stel 'n nul en alternatiewe hipotese ;
- » Microsoft Excel te gebruik om data te hanteer en aan te bied;
- » gebruik van R kosteloze sagteware: die R Projek vir Statistiese Berekening (<https://www.r-project.org>) vir statistiese analises;
- » organiseer dataraamwerke vir statistiese ontledings;
- » oorspronklike data te verken (tabelle en grafieke): bv. histogram, digtheidsdiagramme, verspreidings-diagramme en boksplotte
- »
- » data statisties te beskryf deur gebruik te maak van gemiddeldes, mediane,

- |   |  |
|---|--|
| <ul style="list-style-type: none"> <li>○ relate two variables to one another using correlation and linear regression;</li> <li>○ perform analyses of covariance (ANCOVAs) where appropriate;</li> <li>» perform power analyses to choose sample sizes, and assess effect sizes;</li> <li>» relate the results of statistical analyses back to original research hypotheses or questions;</li> <li>» learn appropriate reporting of analysed data and statistics.</li> </ul> | <ul style="list-style-type: none"> <li>standaardafwykings en reikwydtes;</li> <li>» te kan assesseer of data normaal versprei is of nie;</li> <li>» die toepaslike statistiese toetse te kan kies en uitvoer om:           <ul style="list-style-type: none"> <li>○ in enkele veranderlike te vergelyk tussen twee, drie of meer groepe deur van t-toetse en ANOVAs of hulle nie-parametriese ekwivalente gebruik te maak,</li> <li>○ twee veranderlikes met mekaar in verband te bring deur gebruik te maak van korrelasies of liniére regressie;</li> <li>○ analises van ko-variansie (ANCOVAs) te kan uitvoer waar toepaslik;</li> </ul> </li> <li>» krag analises uit te voer om steekproefgroottes te kies, en om effek groottes te bepaal;</li> <li>» die resultate van statistiese analises terug in verband te bring met die oorspronklike navorsingshipotese of vrae; en</li> <li>» al hierdie vaardighede te kombineer om in wetenskaplike verslag te skryf in die formaat van in manuskrip vir voorlegging aan in wetenskaplike joernaal, met die toepaslike rapportering van geanalyseerde data en statistiek..</li> </ul> |
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## Scheduled learning opportunities

The official timetable indicating all scheduled learning opportunities and their allocated venues can be accessed via [My.SUN](#).

### Lectures

The course comprises 36 lectures, three per week, on Tuesdays (0900-1000), Wednesdays (1100-1200) and Fridays (1200-1300). Lectures will be in the Annex (Rm 1030), Natural Sciences Building.

### Practicals

There are 12 three-hour practical sessions, one per week for each student, Mondays, 1400 – 1700 (venues: Narga H). Microsoft Excel and PowerPoint will be used in these sessions, and we assume a basic knowledge of these programmes. We will also introduce you to the R Project for Statistical Computing and R Studio free software and give you extensive opportunities to familiarize yourself with these programmes. For example, you will write code to run statistical analyses and visualize results.

## Study material

The statistical component of the course is based on:

McKillup, S. (2012) Statistics Explained: an Introductory Guide for Life Scientists (2<sup>nd</sup> Edition). Cambridge University Press, Cambridge, UK.

Additional material will be made available on SunLearn.

SUNLearn is the official learning management platform of Stellenbosch University. Each module has a dedicated page on this platform which can be accessed via this link: <https://learn.sun.ac.za/>

## Geskeduleerde leergeleenthede

Die amptelike rooster wat al die geskeduleerde leergeleenthede en die toegewysde lokale aandui, is beskikbaar by [My.SUN](#).

### Lesings

Die kursus bestaan uit 36 lesings, drie per week, op Dinsdae (0900- 1000), Woensdae (1100-1200) en Vrydae (1200-1300). Lesings sal in die Annex (kamer 1030), Natuurwetenskappe gebou aangebied word.

### Praktika

Daar is 12 drie-uur lange praktiese sessies, een per week vir elke student, Maandae, 1400 – 1700 (Lokaal Narga H). Microsoft Excel en PowerPoint sal in hierdie tutoriale gebruik word, en ons aanvaar dat 'n basiese kennis van hierdie programme in plek is. Ons sal julle ook bekend stel aan R Projek vir Statistiese Berekening kostvrye sageware en aan julle baie geleentheid bied om jyself aan hierdie program gewoond te maak, en om kode te skryf en statistiese analises uit te voer en te visualiseer.

## Studiemateriaal

Die statistiese komponent van die kursus is gebaseer op:

McKillup, S. (2012) Statistics Explained: an Introductory Guide for Life Scientists (2<sup>nd</sup> Edition). Cambridge University Press, Cambridge, UK.

Addisionele materiaal sal op SunLearn beskikbaar gestel word.

SUNLearn is die amptelike leerbestuursplatform van die Universiteit Stellenbosch. Elke module het 'n toegewysde blad op hierdie platform met toegang via hierdie skakel: <https://learn.sun.ac.za/>

## Lecturers

Course coordinator: Prof. Susana Clusella-Trullas

**Lecturers:**

Prof. Susana Clusella-Trullas (SCT), Room 3071 (E-mail: [sct333@sun.ac.za](mailto:sct333@sun.ac.za))

Prof. Conrad Matthee (CM), Room 2031 (E-mail: [cam@sun.ac.za](mailto:cam@sun.ac.za))

Tania Pogue (TP), Room 3068 (E-mail: [tpogue@sun.ac.za](mailto:tpogue@sun.ac.za))

Technical assistant: Shula Johnson ([shulaj@sun.ac.za](mailto:shulaj@sun.ac.za))

Details regarding peer-to-peer facilitators will be announced on SUNLearn or during practicals.

## Dosente

Kursus koordineerder: Prof. Susana Clusella-Trullas

**Dosente:**

Prof. Susana Clusella-Trullas (SCT), Kamer 3071 (E-mail: [sct333@sun.ac.za](mailto:sct333@sun.ac.za))

Prof. Conrad Matthee (CM) Kamer 2031 (E-mail: [cam@sun.ac.za](mailto:cam@sun.ac.za))

Tania Pogue (TP), Kamer 3068 (E-mail: [tpogue@sun.ac.za](mailto:tpogue@sun.ac.za))

Tegniese-assistent: Shula Johnson ([shulaj@sun.ac.za](mailto:shulaj@sun.ac.za))

Besonderhede rakende eweknie-fasilitateerders sal op SUNLearn aangekondig word of tydens praktika.

## Assessment

This module follows assessment option 5. Please see the [Faculty of Science's assessment guidelines](#) for more details.

Method of assessment	Description	#	Allocated marks	Criteria	Dates
A1	Prac exercises	1	20%		
A1	Soft skill assignment	1	10%		
A1	Report AMOVA	1	10%		
A1	Class test	1	20%		
A2	Final test	1	40%		

Please see the assessments and promotion chapter in the [SU Calendar Part 1 \(General\)](#) for institutional rules regarding assessments.

*Class (A1) test: 27 March 2025 (NARGA)*

*Soft skill assignment: tba*

*Report (AMOVA): tba.*

*Final (A2) test: 05 June 2025 (NARGA)*

*Sick test (A3): 24 June 2025 (all content)*

Semester test and exams held in NARGA, exact venue will be announced on SunLearn and in class.

## Assesserings

Hierdie module volg assessoringsopsie 5. Raadpleeg die [Fakulteit Natuurwetenskappe se assessoringsriglyne](#) vir meer besonderhede.

Metode van assessoring	Beskrywing	#	Punte toegeken	Kriteria	Datums
A1	Praktiese oefeninge	1	20%		
A1	Sage vaardigheid werksopdrag	1	10%		
A1	AMOVA verslag	1	10%		
A1	Klastoets	1	20%		
A1	Finale test	1	40%		

Raadpleeg die hoofstuk oor assessoring en promovering in [Deel 1 \(Algemeen\) van die US Jaarboek](#) vir institusionele reëls oor assessorings.

*Klastoets: 27 Maart 2025 (NARGA)*

*Sagte vaardigheid werksopdrag: Datum sal verskaf word  
verslag (AMOVA): Datum sal verskaf word.*

*Toets: 05 June 2025 (NARGA)*

*Sick test (A3): 24 June 2025 (alle inhoud)*

Klastoets en eksamens sal in NARGA geskryf word, presiese lokale sal op SunLearn in die klas aangekondig word.

## Calculation of final marks

Practical exercises.....	20%
Oral/Poster presentation.....	10%
Report AMOVA .....	10%
Class test .....	20%
Final test.....	40%
<b>Final mark .....</b>	<b>100%</b>

All assessments are compulsory and in order to pass the module, you need to achieve a *Final Mark* of at least 50%.

## Berekening van finale punte

Praktiese oefeninge .....	20%
Mondeling /Plakkaatvoordrag.....	10%
AMOVA verslag .....	10%
Klastoets.....	20%
Finale Toets.....	40%
<b>Finale punt .....</b>	<b>100%</b>

Alle assessorings is verpligtend en om hierdie module te slaag, moet jy 'n Finale punt van ten minste 50% verwerf.

## Absenteeism (Missed opportunities)

Please see the section 11 of the [SU Calendar Part 1 \(General\)](#) for the institutional rules regarding absence from classes and or tests.

Take note that for any absence from the university *for more than one* teaching, learning or assessment opportunity, for whatever reason, students need to apply for leave of absence from the Registrar's office. If you are absent for exactly one teaching, learning or assessment opportunity you need to consult your lecturer immediately and provide the appropriate evidence as stipulated in the calendar.

When you miss a test or deadline, you must hand in a valid original medical certificate to Shula Johnson ([shulaj@sun.ac.za](mailto:shulaj@sun.ac.za))

**within one week of the test or hand-in date.** In special circumstances (e.g. participation in provincial or national sporting events) a letter is required from the sporting body. **In these instances, granting of permission to miss tests or deadlines is at the discretion of the course co-ordinator, and is not automatic.** It is your own responsibility to make sure that you know the time and place of each test and exam.

Reports handed in late will have marks deducted at a rate of 5% per day. Reports handed in a week or more after the deadline will not be marked. If a practical is missed for medical reasons, the student needs to complete the practical on his/her own time and valid original medical certificate presented within 2 days from absence.

## Afwesigheid (die misloop van 'n leergeleentheid)

Raadpleeg asseblief afdeling 11 in [Deel 1 \(Algemeen\) van die US Jaarboek](#) vir die institusionele reëls met betrekking tot afwesigheid van klasse en of toetse.

Neem kennis dat studente by die Registrateur moet aansoek doen vir verlof tot afwesigheid, vir watter rede ook al, van *meer as een* onderrig-, leer-, of assesseringsgeleentheid,

Indien jy afwesig is van presies een onderrig-, leer-, of assesseringsgeleentheid, moet jy die betrokke dosent onmiddellik kontak en die toepaslike bewys van rede tot afwesigheid inhandig, soos uiteengesit in die Jaarboek.

Wanneer jy 'n toets of sperdatum mis, moet jy 'n oorspronklike geldige mediese sertifikaat aan Shula Johnson ([shulaj@sun.ac.za](mailto:shulaj@sun.ac.za)) oorhandig **binne een week van die toets of inhandigingsdatum.** Onder spesiale omstandighede (bv. deelname aan provinsiale of nasionale sportbyeenkonste) word 'n brief verlang van die sportbeheerliggaam. **In hierdie gevalle is die toestaan van vergunning om 'n toets of sperdatum te mis onderhewig aan die goeddenke van die kursuskoordineerder, en gebeur dit nie automaties nie.** Dit is jou eie verantwoordelikheid om seker te maak dat jy weet waar en wanneer elke toets en eksamen geskryf word.

Verslae wat laat ingehandig word sal onderhewig wees aan aftrekking van punte teen 'n tempo van 5% per dag. Verslae wat 'n week of meer na die sperdatum ingehandig word sal nie gemerk word nie. Indien 'n prakties vir mediese redes gemis word, word daar van die student verwag om die prakties in sy/haar eie tyd te voltooi en 'n geldige, oorspronklike mediese sertifikaat moet binne 2 dae na die afwesigheid ingehandig word.

<h2>Communication</h2> <p>The <b>announcement forum on the SUNLearn module page</b> is the only official platform that will be used to make announcements relevant to this module. Please check this regularly.</p> <p>For communication with individual students, lecturers, support staff and peer-to-peer facilitators will only use students' official SUN email addresses.</p> <p>Students are also requested to use their official <b>SUN email addresses</b> for all academic related communication to: Clusella-Trullas, S, Prof [sct333@sun.ac.za]</p>	<h2>Kommunikasie</h2> <p>Die <b>aankondigingsforum op die SUNLearn moduleblad</b> is die enigste amptelike platform wat gebruik sal word om aankondigings, wat relevant is vir hierdie module, te maak. Kontroleer dit asseblief gereeld.</p> <p>Vir kommunikasie met individuele studente, sal dosente, steunpersoneel en eweknie-fasiliteerders slegs studente se amptelike SUN-e-posadresse gebruik.</p> <p>Studente word ook versoek om hul amptelike <b>SUN-e-posadresse</b> vir alle akademiese verwante kommunikasie te gebruik na: Clusella-Trullas, S, Prof [sct333@sun.ac.za]</p>
<h2>Addressing challenges</h2> <p>For any complaints, the first port of call is the class representative or the lecturer. If not satisfactorily resolved, it can be escalated to the Head of Department or <a href="#">Coordinator: Academic and Student Affairs</a>.</p>	<h2>Hantering van uitdagings</h2> <p>Vir enige klagtes, is die klasverteenwoordiger of dosent die eerste plek om hulp te soek. Indien die probleem nie bevredigend opgelos word nie, kan dit na die Departementshoof of <a href="#">Koördineerder: Akademiese- en Studentesake</a> verwys word.</p>
<h2>Academic Misconduct</h2> <p>Academic misconduct includes plagiarism, collusion, cheating and fabrication as stipulated in the <a href="#">Disciplinary code for students of Stellenbosch University</a>.</p> <p>Plagiarism is regarded as a serious offence. More serious cases are handled as set out in the <a href="#">Stellenbosch University procedure for the investigation and management of allegations of plagiarism document</a>. Less serious cases are dealt with by the module coordinator and respective department as set out by the procedures of the faculty.</p>	<h2>Akademiese Wangedrag</h2> <p>Akademiese wangedrag sluit plisiaat samespanning, bedrog en versinsel in, soos bepaal in die <a href="#">Dissiplinêre kode vir studente van die Universiteit Stellenbosch</a>.</p> <p>Plisiaat word as 'n ernstige oortreding beskou. Ernstiger gevalle word hanteer soos uiteengesit in die <a href="#">Universiteit Stellenbosch se dokument oor die prosedure vir die ondersoek en bestuur van bewerings van plisiaat</a>. Minder ernstige gevalle word deur die modulekoördineerder en betrokke departement hanteer soos uiteengesit in die fakulteitsprosedures.</p>

Lectures (Annex (Rm 1030), Natural Sciences Building : Tuesdays (09h00-09h50), Wednesdays (11h00-11h50) and Fridays (12h00-12h50). /Lesings (Annex (Kamer 1030), Natuurwetenskappe Gebou: Dinsdae (09h00-09h50), Woensdae (11h00-11h50) en Vrydae (12h00-12h50).

Lect / Dosent #	Date / Datum	Topic / Onderwerp	Lecturer / Dosent
<b>36 lectures / 36 lesings</b>			
1	11/02	Introduction to the course / Inleiding tot die kursus	SCT
2	12/02	The scientific method / Die wetenskaplike metode	SCT
3	14/02	Basic descriptive statistics / Basiese beskrywende statistiek	SCT
4	18/02	Prac revision / Praktiese hersiening	SCT
5	19/02	Normal distribution and null hypothesis testing / Normaalverspreiding en nu- hypotese toetsing	SCT
6	21/02	Ethics, permits, and collaborations / Etiek, permitte en samewerking	TP
7	25/02	Prac revisions & Experimental design	SCT

		(power) / Praktiese hersiening & eksperimentele ontwerp	
8	26/02	Comparing two population means: two samples <i>t</i> -test / Vergelyking van twee populasie gemiddelde: 2 monster <i>t</i> -toets	SCT
9	28/02	Time and project management / Tyd- en projekbestuur	TP
10	04/03	Experimental design principles & Revisions prac / Eksperimentele ontwerp beginsels & Hersiening prakties	SCT
11	05/03	Comparing two means: non-parametric tests / Vergelyking van twee gemiddeldes: nie-parametriese toetse	SCT
12	07/03	Data collection and presentation / Data insameling en aanbieding	TP
13	11/03	Prac revisions & Test questions / Hersiening prakties	SCT
14	12/03	Analysis of variance ANOVA / Analise van variansie ANOVA	SCT

15	14/03	Data presentation	TP
16	18/03	Prac revision & Hersiening prakties	SCT
17	19/03	AMOVA / AMOVA	CM
	21/03	<b>Public holiday / Publieke vakansiedag</b>	
18	25/03	AMOVA / AMOVA	CM
19	26/03	AMOVA /AMOVA	CM
20	28/03	AMOVA AMOVA	CM

**29 March – 6 April: Student recess**

21	08/04	How to report statistics / & Hoe om statistiek te rapporteur	SCT
22	09/04	Correlation / Korrelasie	SCT
23	11/04	Scientific writing extra material / Wetenskaplike skryfwerk ekstra materiaal	TP/SCT
24	15/04	Prac revision correlation / Praktiese hersiening korrelasie	SCT
25	16/04	Linear regression / Liniére regressie	SCT
26	17/04 - thursday	Friday timetable – ANCOVA / Vrydag rooster - ANCOVA	SCT
	18/04	<b>Public holiday / Publieke vakansiedag</b>	
27	22/04	Scientific writing / Wetenskaplike skryfwerk	TP
28	23/04	The publication process / Die publikasie proses	TP
29	25/04	Data presentation extra material / Data aanbieding ekstra materiaal	TP/SCT
	28/04	<b>Public holiday / Publieke vakansiedag</b>	
	29/04	Monday timetable-practical ANCOVA /	SCT

		<b>Maandag rooster – praktiese ANCOVA</b>	
30	30/04	Prac revision linear regression and ANCOVA / Praktiese hersiening liniére regressive en ANCOVA	SCT
31	02/05	Popular science and the media / Populäre wetenskap en die media	TP
32	06/05	Popular science and the media extra material / Populäre wetenskap en die media ekstra materiaal	TP/SCT
33	07/05	Networking and career development / Netwerking en loopbaan ontwikkeling	TP
34	09/05	Career development extra material / Loopbaanontwikkeling ekstra materiaal	TP/SCT
35	13/05	<i>Revisions for exam / Hersiening vir eksamen</i>	SCT/CM
36	14/05	<i>Revisions for exam / Hersiening vir eksamen</i>	SCT/CM

Practicals: Mondays, 14:00 – 17:00 (venue: Narga H). / Praktika: Maanda, 14:00 – 17:00 (lokaal: Narga H)

Prac # / Prakties #	Date / Datum	Topic / Onderwerp	Lecturer / Dosent
1	10/02	Introduction to R / Bekendstelling aan R	SCT
2	17/02	Data handling in R / Datahantering in R	SCT
3	24/02	Normality test and confidence limits / Normaaltoetsing en vertrouensperke	SCT
4	03/03	Power test and two sample test / Kragtoets en twee monster toets	SCT
5	10/03	Paired designs and non-parametric two sample test / Gepaarde ontwerpe en nie-parametriese twee monster toets	SCT
6	17/03	Analysis of variance / Analise van variansie	SCT
7	24/03	AMOVA / AMOVA	CM
<b>29 March – 6 April: Student recess</b>			
	07/04	No prac	SCT
8	14/04	Correlations / Korrelasies	SCT

	21/04	<b>Public holiday / Publieke vakansiedag</b>	SCT
9	29/04	<b>Monday timetable / Maandag rooster</b> Linear regression and analysis of covariance / Liniére regressie en analise van kovariansie	
10	05/05	Project management assignment / Projekbestuur werksopdrag	TP
11	12/05	<i>AI tools &amp; discussion / AI gereedskap en bespreking</i>	Invited guest