



FIG Working Week 2024

19-24 May

Accra, Ghana

Your World, Our World:
Resilient Environment
and Sustainable
Resource Management
for All

Presented at the FIG Working Week 2024,
19-24 May 2024 in Accra, Ghana

From Geomatics to Geospatial Science and Surveying: Undergraduate curriculum review at the University of Cape Town, South Africa

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Motivation

Shifting the focus.

Curriculum creep.

Lack of differentiation between streams.

Low student enrolment.

Low progression rate and overly prescriptive pre- and co-requisites.

Heavy workload for students and staff.

Objective: to design a curriculum that addresses new and emerging knowledge areas, is attractive to new students, improves throughput and reduces the credit load.



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Context – existing curriculum

Accreditation

- Council for Higher Education (CHE)
- South African Geomatics Council (SAGC)

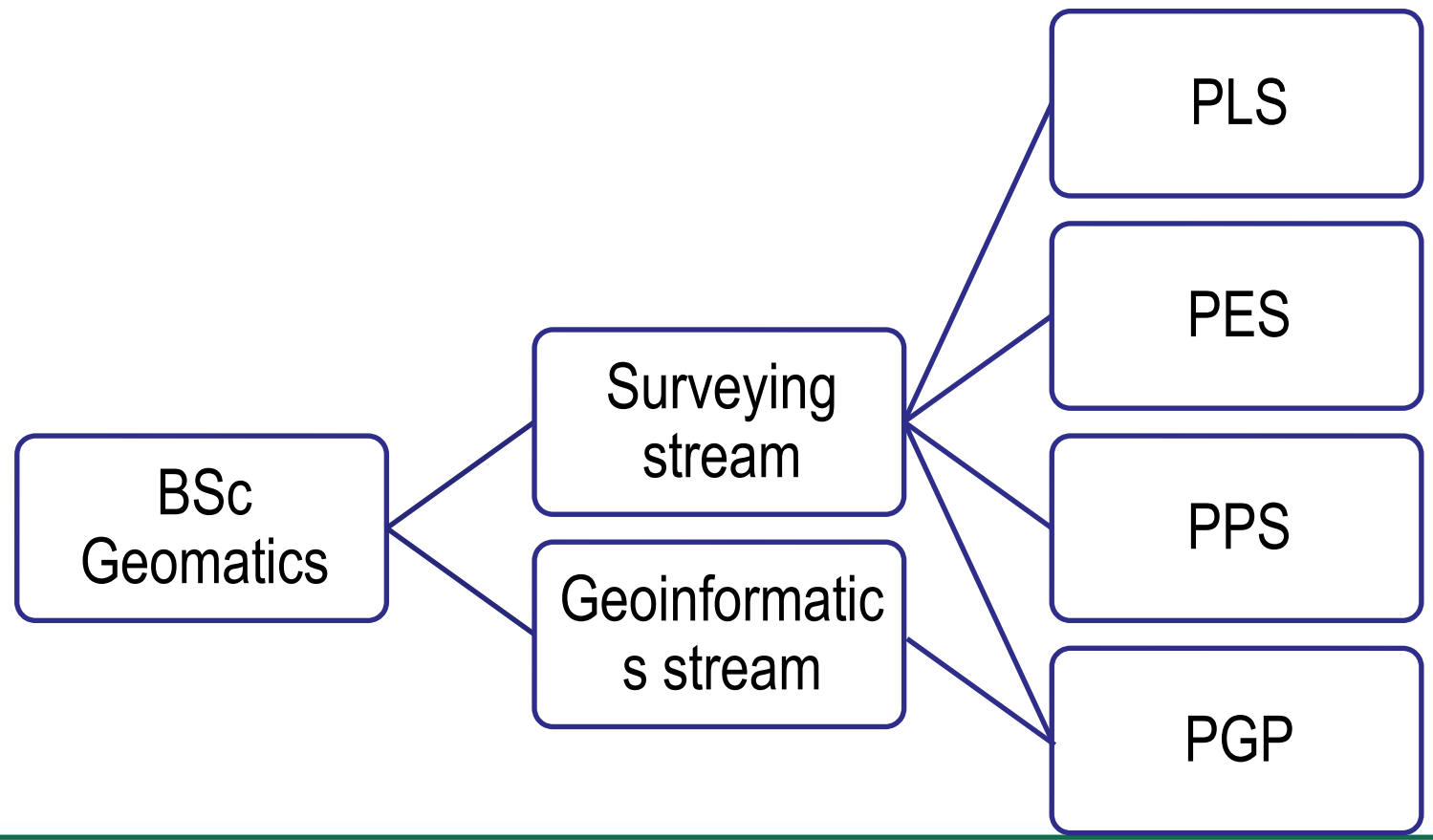




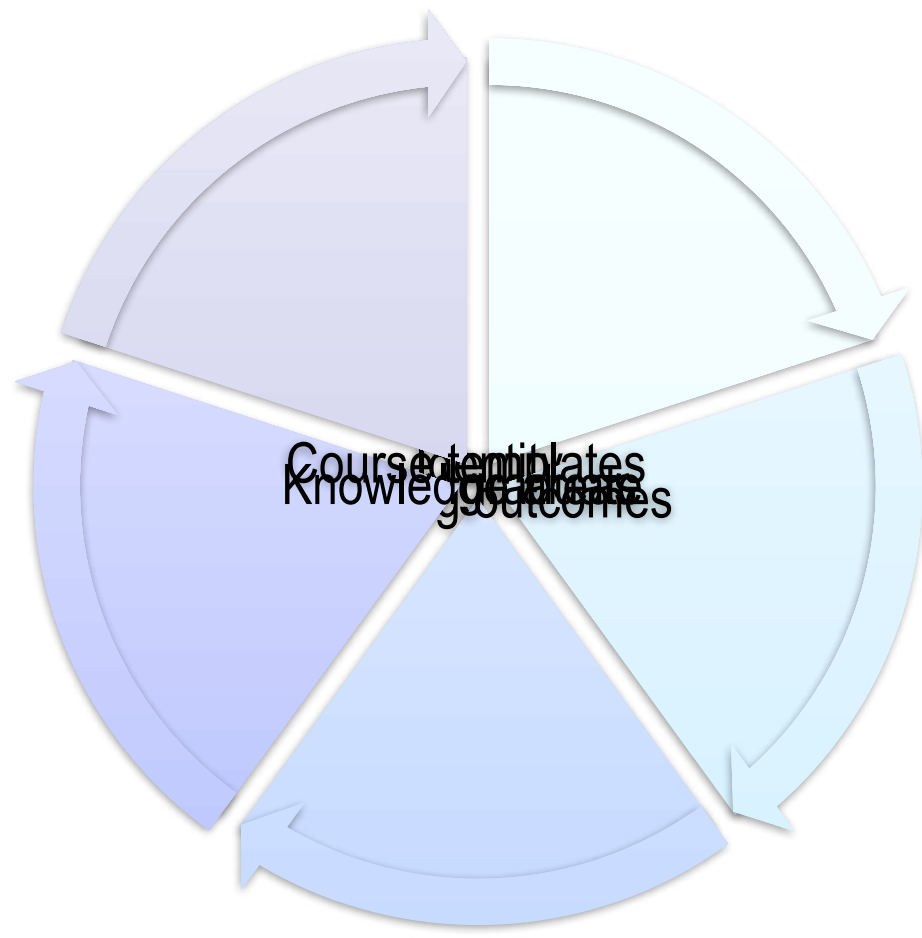
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Blue Sky Approach



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The desired graduate

'We are specialists in the measurement, mapping, modelling, monitoring and management of spatial features and phenomena of interest, designing solutions to help address current local, regional, and global societal and environmental challenges (focussing particularly in Africa), by using cutting-edge technologies and developing innovative procedures for critical and creative analysis, and applying professional skills to manage and communicate through suitable platforms.'


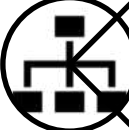




-  Measure/Record Spatial and Attribute Data
-  Manage Spatial Data and Projects
-  Produce and Interpret Spatial Models
-  Understand, Analyse, and Interrogate Spatial Data and Legislation
-  Apply interdisciplinary skills and knowledge
-  Identify with spatial science profession and domain of work.



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Reality check...

- SAGC new accreditation frameworks: Geoinformatics body of knowledge is **significantly expanded**
- Council for Higher Education imposed maximum credit load: 480 credits + 10% = 528 credits
- Result: retain current streams
 - Geospatial Surveying accredited for PLS
 - Geospatial Data Science accredited for PGP

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New course structure – years 1 & 2

Course Name	Semester	Credits
Introduction to Geospatial Sciences	1	8
Introduction to Earth and Environmental Sciences	1	18
Mathematics IA for Engineers	1	18
General Physics A	1	18
Spatial Measurement Techniques	2	18
Introduction to Programming	2	16
Mathematics IB for Engineers	2	18
Statistics for Engineers	2	12
Total Credits – year 1		126
Fundamentals of GISc	1	16
Cartography	1	16
Plane and Construction Surveying	1	16
Introduction to Remote Sensing	1	12
Linear Algebra and DEs for Engineers	1	16
Vector Calculus for Engineers	2	16
Geometrical Geodesy	2	16
Spatial Data Adjustments	2	16
Photogrammetry	2	16
Applied Surveying and GISc	2	6
Practical Training	X	0
Total Credits – year 2		146





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New course structure – years 3 & 4

Geospatial surveying

Course Name	Semester	Credits
Spatial Control Network Design and Analysis	1	18
Spatial Statistics	1	16
Cadastral surveying	1	16
Real Property Law	1	16
Land tenure and land law	2	16
Coordinate Systems and Map Projections	2	18
Satellite and Space-based Positioning Systems	2	18
Advanced Spatial Measurement	2	16
Total Credits – year 3		134
Research Methods	1	8
Physical Geodesy	1	16
Precise Engineering and Deformation Surveying	1	18
Geospatial Sciences Project	1&2	32
Land Development and Planning	2	24
Business Practice and Professional Project management for Geospatial Scientists	2	12
Professional Practice and Ethics in Geospatial Sciences	2	12
Total Credits – year 4		122
Total Credits for Geospatial Surveying stream		528

Geospatial Data Science

Course Name	Semester	Credits
Spatial Statistics	1	16
Design and Development of Geospatial Systems	1	18
Geo-Visualisation	1	16
Spatial Data Architectures	1&2	24
Practitioners Portfolio	1&2	20
Coordinate Systems and Map Projections	2	18
Satellite and Space-based Positioning Systems	2	18
Total Credits – year 3		130
Research Methods	1	8
3D scene Reconstruction and Data Science	1	18
Computing and Data Infrastructures	1	18
Geospatial Sciences Project	1&2	32
Application elective	1 or 2	18 - 24
Business Practice and Professional Project management for Geospatial Scientists	2	12
Professional Practice and Ethics in Geospatial Sciences	2	12
Total Credits – year 4		118 - 124
Total Credits for Geospatial Data Science stream		520 - 526



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Rebranding

“Beyond our community, the term ‘geomatics’ is unfamiliar and ill defined” (Brown, GIM International, 2018)



Is ‘Geomatics’ an obstacle to student enrolment?



Would ‘Geospatial Science and Surveying’ be better?

- Industry consultation: 157 responses, 111 from industry specialists with professional registration.

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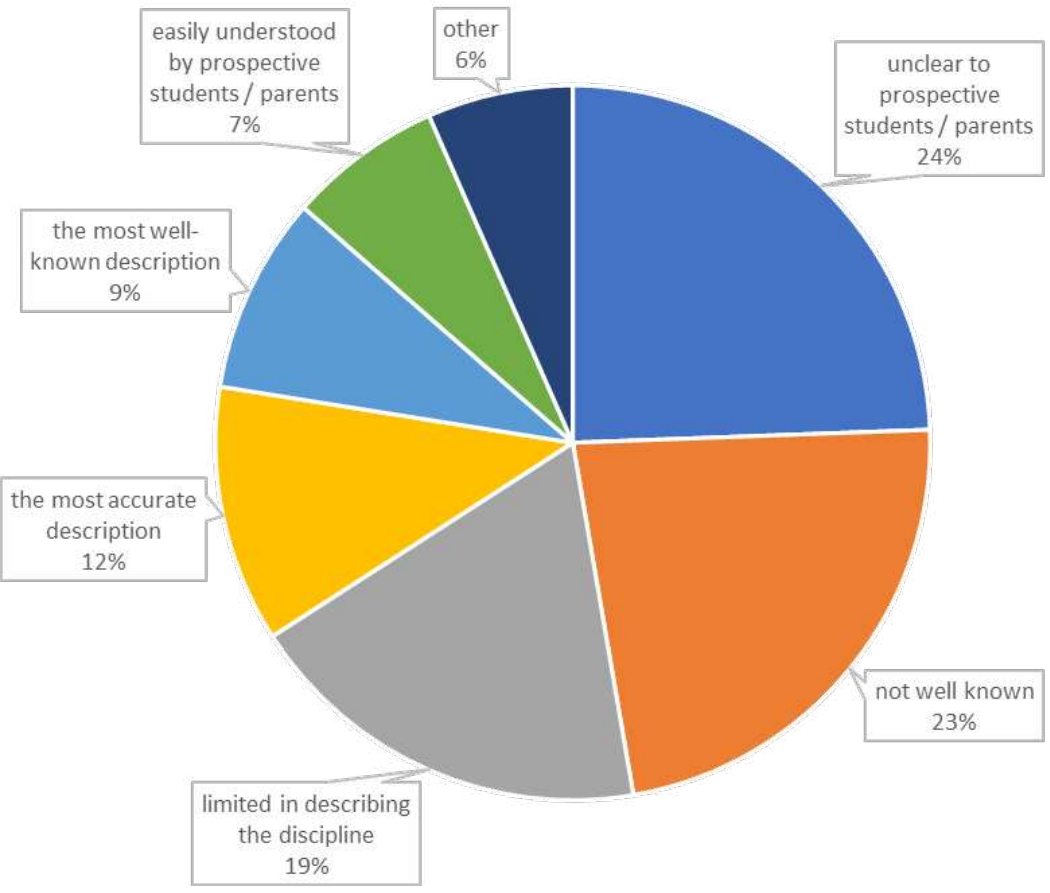
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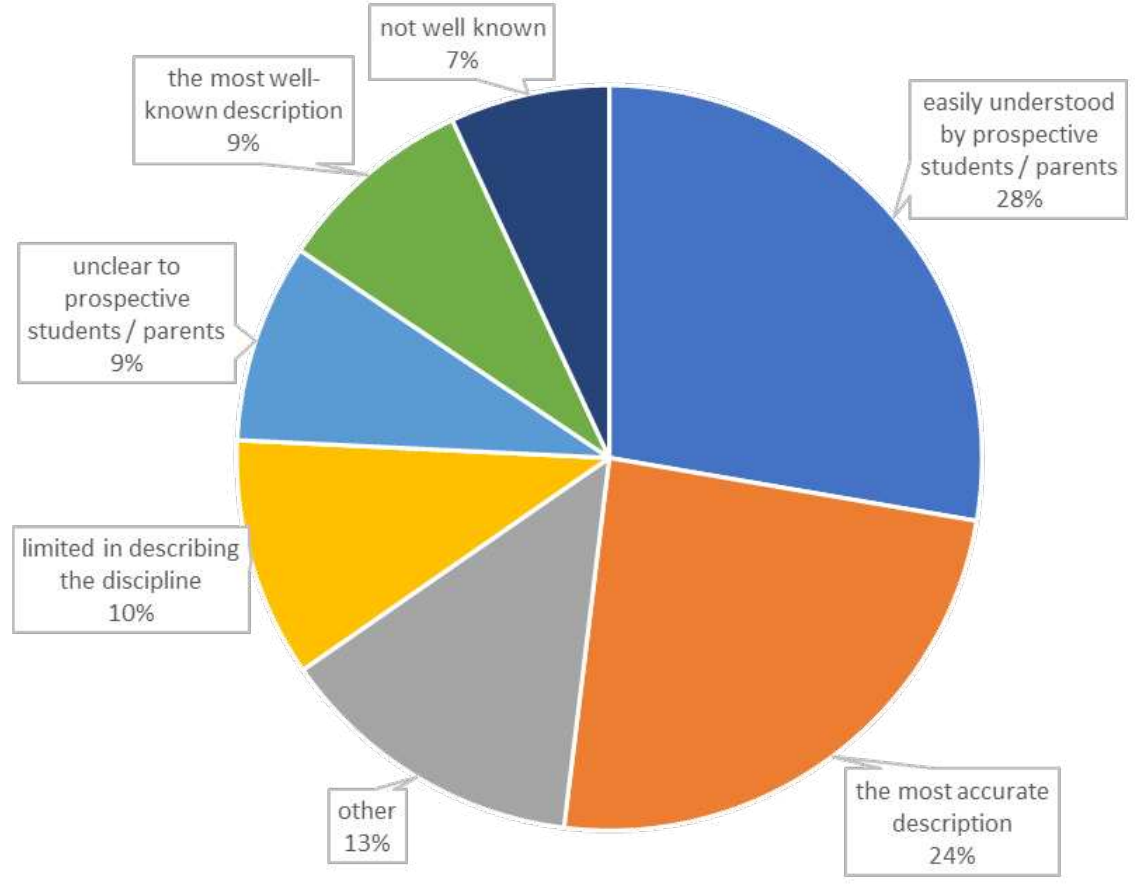
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Geomatics is...



Geospatial Science and Surveying is...



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Name suggestions

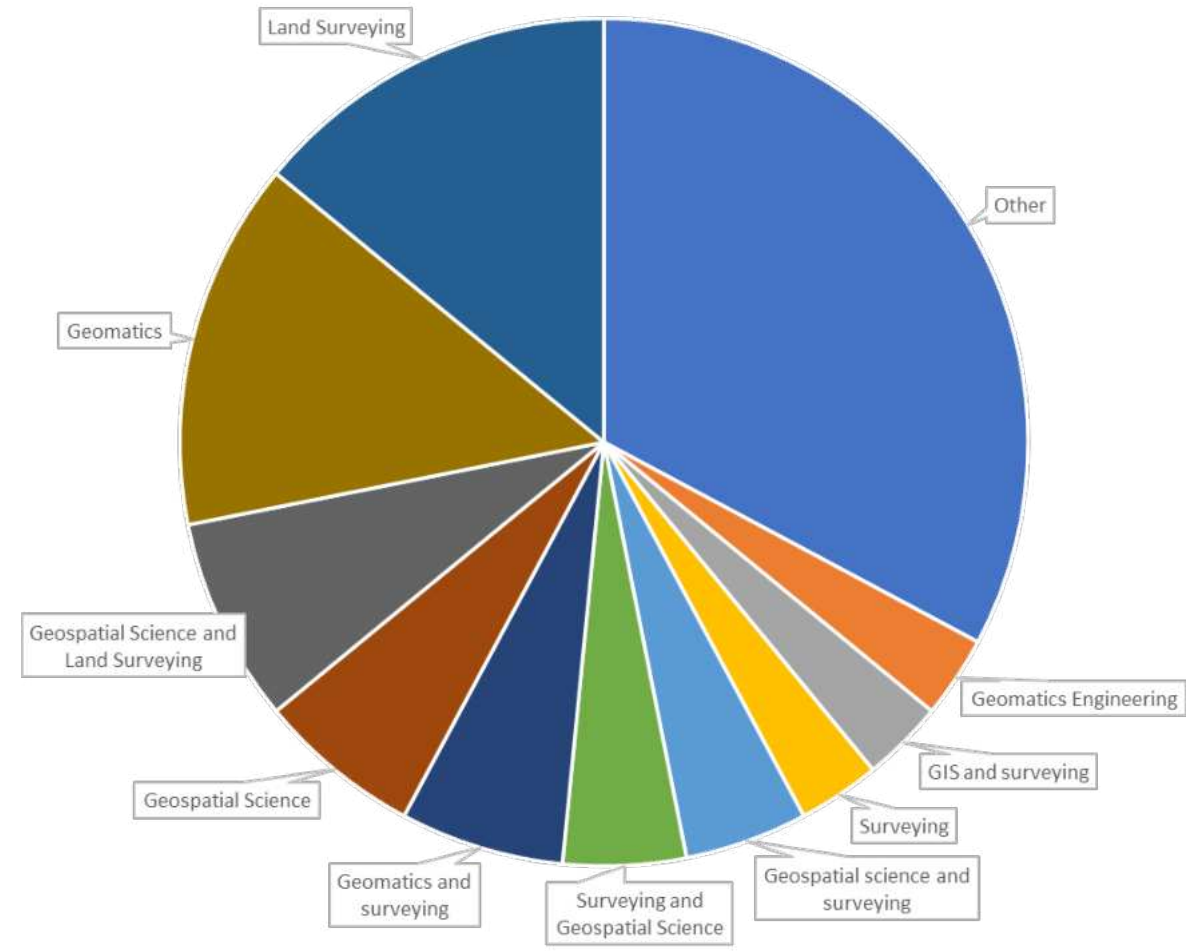
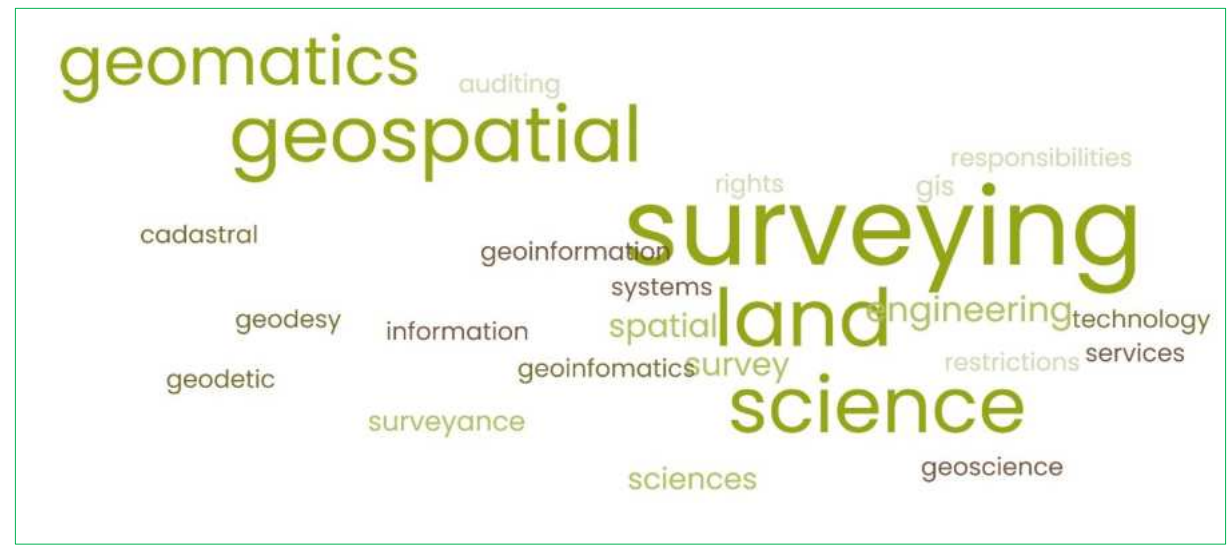




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In conclusion...

Shifting the focus	• satisfactorily addressed
Curriculum creep	• satisfactorily addressed
Stream similarity	• not addressed
Student enrolment and progression	• wait and see...
Student workload	• satisfactorily addressed
Staff workload	• not addressed



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SUSTAINABLE DEVELOPMENT GOALS

International Federation of Surveyors supports the Sustainable Development Goals

Commission 2

Professional Education

Serving Society for the Benefit of People and Planet

