



University of the Witwatersrand, Johannesburg
School of Geosciences



Rocks and minerals revealed: An introductory course in geology

The School of Geosciences at the University of the Witwatersrand will be presenting an exciting and very popular 20-week course on basic geology. This is a great opportunity to find out more about how the Earth works. There is an economic focus to the course making it suitable for anyone involved in the minerals industry who would like to learn something about the terminology used. However it is suitable for all interested beginners. The course is presented by a range of expert staff with many years of experience. During the course there will be hands-on practical work on mineral and rock identification together with a look at some geological maps. A certificate of participation will be given at the end of the course. No examination is involved, only a self-evaluation practical test in the last week. A minimum number of 15 participants is required to make the course viable. A maximum of 45 participants can be accommodated so register early to avoid disappointment.

Course cost:	R5670
Retired participants:	R4860
Couple:	R9720

Course materials will include a book, printed handouts each week in black and white, course content in colour on a CD at the end of the course, a magnifying hand lens, and tea/coffee and snacks during the break. Participants are not expected to provide anything in addition.

Contributing staff include:

Dr. Grant Bybee	Dr Zubair Jinnah
Prof. Judith Kinnaird	Prof. Spike McCarthy
Prof. Grant Cawthorn	Prof. Paul Nex
Prof. Roger Gibson	Prof. Sue Web

If there is sufficient interest, staff will run one-day field trips. Potential trips are:-

Vredefort – the world’s greatest disaster.	Leader: Prof. Roger Gibson
Tswaing – results of a 15 megaton explosion.	Leader: Prof Gillian Drennan
Maropeng and Sterkfontein – the story of us all.	Leader: Cameron Penn Clarke
Walter Sisulu Gardens – a walk through time.	Leader: Prof. Grant Cawthorn
The geology of Johannesburg.	Leader: Prof. Carl Anhaeusser

With the exception of the latter trip, these can be family outings although unsuitable for children under the age of 6. Field trips would incur a slight extra charge.

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A tentative timetable, which will be revised according to staff availability

	Date	Lec.	Lecture - ~ 55 minutes		Practical - ~ 2 hours	
Mar	15	1	Planet Earth – Why are we special? The Earth in Space: formation of the Earth and solar system: structure of the Earth	JK	Mineral world: how to appreciate and identify minerals	JK, GB
	22	2	The Wonder of Minerals Mineral Kingdom: abundance of elements; silicate structures, non-silicates	JK	Geological Lego: the building blocks of rocks. Crystals and minerals	JK, GB
	29	3	Earth and Time – a brief history of our planet	GB	Rock-forming minerals	GB
April	5	4	Plate Tectonics – The Unifying Theory	PN	Geological maps: a story in 4 dimensions	PN
	12	5	Under stress: Deforming the Earth; faults, folds, unconformities	PN	Reading the rocks on maps	PN
	19	6	Probing the Inaccessible Earth: Geophysics, earthquakes	SW	What goes round comes around: the rock cycle - igneous, sedimentary, metamorphic rock relationships	GB, JK,
	26	7	From mountain tops to the depth of the oceans: Sedimentary rocks and their classification	ZJ	Sedimentary rocks	ZJ
May	3	8	Magma and minerals: A hot topic Igneous rocks and their classification	GB	Looking inside rocks Introduction to the microscope	GB
	10	9	Hot and sweaty: Metamorphic rocks	RG	Metamorphic rocks	RLG
	17	10	Sedimentary Processes – basins, the carbon cycle and the origin of life	ZJ	Sedimentary rocks in hand specimen and under the microscope including Wits host rocks to gold	ZJ
	24	11	Sedimentary Processes - coal, oil	ZJ	sedimentary rocks- porous sandstones, salt etc	ZJ
	31	12	The forces of Vulcan: Igneous Processes- volcanic rocks	GB/GC	How to tell a granite from a gabbro: igneous rocks in hand specimen and under the microscope	GB, GC
Jun	7	13	Igneous Processes- intrusions, fractionation	GB/GC	Igneous rocks in hand specimen and under the microscope	GB
	14	14	The Bushveld Complex – the greatest ore repository on Earth	GC	Bushveld Complex, rocks and minerals	GC
	21	15	Other important intrusions	JK	Kimberlites, carbonatites, granites	JK
	28	16	Igneous Ore-Forming Processes	JK	All that glistens is not gold: Igneous ore minerals	JK, PN
July	5	17	Sedimentary Ore-Forming Processes	JK	Manganese ores, Pb-Zn etc	JK, PN
	12	18	Hydrothermal Ore-Forming Processes	JK	Hydrothermal ore deposits in South Africa	JK, PN
	19	19	The Restless Planet: Earth through Time – Lessons from South Africa (lecture 1)	TM	Lessons from South Africa (lecture 2)	TM
	26	20	Earth: Where to now?	TM	Questions and answers Self evaluation practical test	JK

The Course presenters:

Dr. Grant Bybee is a lecturer in geochemistry and petrology in the School of Geosciences. Grant graduated from Wits University in 2008 with a B.Sc. Honours degree (*cum laude*) in geology and geochemistry and obtained his Ph.D. in 2013. His current research focuses on using geochemistry, in particular isotope geochemistry, to understand aspects of solid Earth evolution. He was awarded a NRF/DoL Scarce Skills Scholarship for his postgraduate research and was also a Pre-Doctoral Fellow at the Department of Terrestrial Magnetism at the Carnegie Institute for Science in Washington D.C.

Prof. Grant Cawthorn Grant has taught at Wits for 38 years and is the Platinum Industry's Professor of Igneous Petrology. He was the first recipient of the University's distinguished teaching award, and was awarded a Doctorate of Science in 2006. He has been chairperson of the Mineralogical Association of South Africa and the Bushveld Branch of the Geological Society. He has published over 140 research papers in international journals.

Prof Roger Gibson is head of the School of Geosciences. He has a broad teaching and research experience and has won a University award for the quality of his teaching. His research focusses on the fields of structural geology, high-grade metamorphism and on meteorite impact sites. He has published widely most notable his books on the Vredefort meteorite impact.

Dr. Zubair Jinnah is a lecturer in sedimentology in the School of Geosciences. His research focuses on the relationship between sedimentation, tectonics, and climatic and environmental change, particularly in fossil-bearing rock successions that are important in understanding the development of life.

Prof Judith Kinnaird is Director of the Economic Geology Research Institute in the School and Co-Director of the National Centre of Excellence for the study of minerals and Energy (CIMERA). She is also past President of the international Society of Economic Geologists. She taught in Scotland and Ireland prior to joining Wits in 1999 and has worked on tin deposits in Nigeria, lead-zinc and copper deposits in Ireland, uranium in Namibia and South Africa, gold in Mozambique, and pegmatites in Nigeria, Somaliland and Namibia. Current research is in Zambia and Namibia as well as on aspects of magmatism and mineralisation in the Bushveld Complex.

Prof Terence (Spike) McCarthy is a Professor Emeritus in the School of Geosciences at Wits. He has wide research interests in the geology and geomorphology of southern Africa and has also published extensively on the wetlands of the region, notably the Okavango Delta. He is an author of three best-selling popular books on geology. He has lectured widely on acid mine drainage in South Africa.

Prof Paul Nex is a Professor of economic geology. He has a broad experience of ore deposits on several continents with special expertise on rare earth deposits, lead-zinc deposits in Ireland, uranium deposits in Namibia, and the Bushveld Complex in South Africa. He has served the GSSA as president and the Society of Economic geologists as vice-president.

Prof Sue Webb is a professor in geophysics in the School of Geosciences at Wits. She is the International Secretary for the Society of Exploration geophysicists where among other duties she helps to identify international issues of strategic importance to AGU. She is also a member of SAGA in South Africa.

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Venue: School of Geosciences, University of the Witwatersrand

Registration form

Title _____ Surname _____ First Name _____

Postal address _____

_____ Code _____

Telephone _____ Mobile _____ Fax _____

Email (Please print clearly) _____

If you intend registering for the course as a couple, please provide your partner's details below:

Title _____ Surname _____ First Name _____

Telephone _____ Mobile _____ Fax _____

Email (Please print clearly) _____

COST - 20 weeks from 6 pm to 9.15 pm each Wednesday

R5670 per participant

R4860 for retired participants

R9720 for a couple

For any queries on the course contact:

Grant Bybee 011 717 6633 083 412 0151 grant.bybee@wits.ac.za

Judith Kinnaird 011 717 6583 084 696 7228 judith.kinnaird@wits.ac.za

Please fax this completed form to 011 717 6579 or Email: danielle.simmons-duarte@wits.ac.za

An invoice will be issued in late February-early March to those who have submitted registration forms once the minimum number of 15 participants has applied for admission to the course. Payment is required before the first lecture. Payment in two deposits can be agreed by prior arrangement.

For any queries on payment contact Danielle Simmons Duarte on 011 717 6580 mornings only