

GEOL 264/364 Igneous Petrology and Volcanology
Final Syllabus 2018

Date	9 am Lecture	12 am Lecture	Lab
Week 1 July 11 MB	Paper introduction; igneous rocks classification and magma properties	Mantle partial melting, MORBs and ophiolites	Igneous rocks, Mantle peridotite, & MORB
Week 2 July 18 MB	Chemical thermodynamics & phase diagrams	Ternary phase diagrams, equilibrium & fractional crystallisation	Layered mafic intrusions
Week 3 July 25 MB	Trace element geochemistry	Alkaline magma series, kimberlites & diamonds	Alkaline mafic volcanics & mantle xenoliths of Otago
Week 4 August 1 MB	Radiogenic isotope geochemistry	OIB & mantle plumes	Hawaiian volcanics
Week 5 August 8 JMP	Major element geochemistry; calc-alkaline magma series	Island arc magmatism	Island arc volcanic rocks (Tonga & others)
FIELD TRIP #1: Southland coast, August 11 & 12 JMP			
Week 6 August 15 JMP	Granite, feldspar phase relations	Continental arc magmatism	Continental arc plutonic rocks (South Island batholiths)
Week 7 August 22 JMP	Water in felsic magmas, pegmatite & aplite	Rhyolite vs. granite, large felsic calderas,	Taupo Volcanic Zone
MID-SEMESTER BREAK, August 25 - September 2			
Week 8 September 5 JDLW	Volcanic systems	Magma transport through crust; sills, dikes, saucers and blobs	Viscosity calculation and controls exercise
Week 9 September 12 JDLW	Magma effusion; lava flows, inflation, brecciation, etc.	Submarine basalts	Pressures & volatiles; bubbles, glass-volatile
FIELD TRIP #2: Daytrip Kakanui, Sept 15 JDLW			
Week 10 September 19 JDLW	Subaerial basaltic eruptions: fountains, bursts & plumes; Hawaii, Stromboli, Paricutin	Subaerial eruptions of evolved magmas: plumes: sub-plinian through ultra-plinian	Fall dispersal & eruption reconstruction
Week 11 September 26 JDLW	Stratovolcanoes: domes, block & ash flows, lavas & autobreccias	Pyroclastic flows and surges & blasts	Particle populations
Week 12 October 3 JDLW	Submarine eruptions of evolved magmas	Subglacial volcanism	North Otago lab: petrography & interpretation of FT#2 section
Week 13 October 10 JDLW	maar-diatreme volcanoes including kimberlite	Tutorial	cont'd from previous week

Instructors: James White (1s5), Marco Brenna (Gs9) & Mike Palin (1s9); Demonstrators: Alessio Pontesilli, Rachael Baxter, and Hazel Conway; Text (highly recommended): Robin Gill, Igneous Rocks and Processes, Wiley-Blackwell (2010); Lectures: Quad 1, 9:00 & 12 :00 W; Labs: 1n5, 14:00-16:50 W or 9:00-11:50 Th

Assessment: 5 x 4% = 20% Quizzes, 2 x 15% = 30% Field Trip Assessments, 50% Final Exam.

Workload guidelines:

activity	number	x	hrs each =	total hrs	marks
lecture & lab	13	weeks	4.5	59	
lecture & lab prep	13	weeks	4	52	
fieldtrips	3	days	6	18	
fieldtrip exercises	2		8	15	30%
quizzes	5		0.25	10	20%
final exam			3	26	50%
exam prep	7.5	hr prep/ hr exam			
total	18	pts	10	180	ok

