**GG8119 Palaeontology MSc course**

**Curriculum**

| Date | Fr.o.m. | T.o.m. | Lecture topics | Lecture Personnel | Practical classes | Prac class personnel | Textbook chapters | Lokal/Room |
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| **Monday 20th Jan, 2020** | 10:15 | 12:00 | **1**. Introduction to course, aims, content, means of assessment; Introduce personal mini-research projects; Assign reading exercise. 2. Definition of fossils; historical background of palaeontology; Modes of preservation; Pseudofossils | MS, CM | | | 3 | PAL seminar room |
| | 13:15 | 15:00 | **1**. Taphonomy, sorting & how fossils relate to depositional environments; Biases in the fossil record; **2**. Classification of life & fossils; Approaches to classification of fossils. Managing fossils: Swedish fossil localities, collecting, preparing and curating fossils; Legal issues with the fossil trade | CM, CS | | | 4, 5 | PAL seminar room |
| | 15:15 | 17:00 | | | Recognizing basic types of fossils and styles of preservation; depositional environments; taphonomic influences on fossil assemblages; approaches to studying and illustrating microfossils, mesofossils and macrofossils | CM | | PAL seminar room & collections |
| **Tuesday 21st Jan, 2020** | 10:15 | 12:00 | Early life: **1.** Deep time, and the origin and evolution of early life, Oxygenation of the atmosphere; **2**. Origins of eukaryotes, meiosis, metazoans. | MI, TS | | | 11, 12 | PAL seminar room |
| | 13:15 | 15:00 | Early life: **1**. Modern microbes/geobiology; **2**. Fossil life in extreme environments; Lessons for the search for life elsewhere in the universe | CD, TS | | | 11, 12 | PAL seminar room |
| | 15:15 | 17:00 | | | Tour of fossil collections - vertebrates, invertebrates, microfossils, plants. | MS, JH, TD | | PAL seminar room & collections |
| **Wednesday 22nd Jan, 2020** | 10:15 | 17:00 | Individual study time | | | | | |
| **Thursday 23rd Jan, 2020** | 10:15 | 12:00 | Palaeozoic plants & ecosystems: **1**. rise of land plants; **2**. Carboniferous coal swamps. | CM | | | 14, 15 | PAL seminar room |
| | 13:15 | 14:00 | Palaeozoic plants & ecosystems: **3**. Contrasting tropical and temperate vegetation and climate of the Permian | SM | | | 14, 15 | PAL seminar room |
| | 14:15 | 16:00 | | | Hands-on acetate peel preparation of permineralized fossils; Demonstration of palaeozoic plant diversity and evolution of roots, leaves, seeds and wood | SM | | Clean lab, 4th floor PAL building |

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| **Friday 24th Jan, 2020** | 10:15 | 12:00 | Mesozoic plants & ecosystems: **1.** Triassic floras (Skåne); **2**. Jurassic floras (Skåne, Yorkshire) | VV, SS | | | 16, 17 | PAL seminar room |
| | 13:15 | 15:00 | | | Visit to Bergianska greenhouse - Evolution of plant diversity (open 11.00-16.00) | VV | | **Bergianska greenhouse** |
| | 15:15 | 17:00 | Mesozoic plants & ecosystems: **3.** Cretaceous floras and biomes; **4.** Rise of angiosperms and co-evolution with insects | VV, SS | | | 16, 17 | PAL seminar room |
| **25th Jan, 2020** | WEEKEND | | | | | | | |
| **26th Jan, 2020** | WEEKEND | | | | | | | |
| **Monday 27th Jan, 2020** | 10:15 | 12:00 | Cenozoic plants & ecosystems: 1. Paleogene hothouse world; **2**. Exploration, analysis and evolution of the Arctic floras | TD | | | 18, 19 | PAL seminar room |
| | 13:15 | 14:00 | Cenozoic plants & ecosystems: **3**. Neogene cooling, aridification and the evolution of the European flora | TD | | | 18, 19 | PAL seminar room |
| | 14:15 | 16:00 | | | Case study of a Cenozoic flora - Mediterranean flora or Arctic flora | TD | | PAL seminar room |
| **Tuesday 28th Jan, 2020** | 10:15 | 12:00 | Invertebrate fossils through time: **1.** Ediacaran faunas; **2**. The Cambrian explosion | CS, TT | | | 13-19 | PAL seminar room |
| | 13:15 | 15:00 | Invertebrate fossils through time: **3.** The Silurian seas - a case study of Gotland; **4**. Devonian marine invertebrates and the Frasnian-Famennian event | CS, TT | | | 13-19 | PAL seminar room |
| | 15:15 | 17:00 | | | Early Palaeozoic invertebrate life - recognizing invertebrate groups | CS | | |
| **Wednesday 29th Jan, 2020** | 10:15 | 17:00 | Individual study time | | | | | |
| **Thursday 30th Jan, 2020** | 10:15 | 12:00 | Invertebrate fossils through time: **5**. Late Palaeozoic faunas; **6**. Triassic faunas - between two mass extinction events; or The ups and downs of cephalopod evolution through the Phanerozoic | TT, SK | | | 13-19 | PAL seminar room |
| | 13:15 | 15:00 | Invertebrate fossils through time: **6.** Jurassic faunas, e.g., a case study of Solnhofen; **7**. Cretaceous seas, e.g., a case study of the Kristianstad Basin | SK, CS | | | 13-19 | PAL seminar room |
| | 15:15 | 17:00 | | | Fossil biotas of Gotland Silurian reefs - fossil types, biofacies and change through time | TT | | |
| **Friday 31st Jan, 2020** | 10:15 | 12:00 | Invertebrate fossils through time: **8**. Cenozoic invertebrates - rise of modern invertebrate faunas; **9**. Unique marine ecosystems - black smokers, methane seeps and whale falls | SK | | | 13-19 | PAL seminar room |
| | 13:15 | 14:00 | Invertebrate fossils through time: **10**. Trace fossils marine and terrestrial | SM | | | 13-19 | PAL seminar room |
| | 14:15 | 16:00 | | | Cretaceous shallow-sea faunas of the Kristianstad Basin | SK | | |
| **1st Feb, 2020** | WEEKEND | | | | | | | |

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| **2nd Feb, 2020** | WEEKEND | | | | | | | |
| **Monday 3rd Feb, 2020** | 10:15 | 12:00 | Invertebrate fossils through time: **1, 2.** Microfossil diversity and biostratigraphic applications | HC | | | 13-19 | PAL seminar room |
| | 13:15 | 15:00 | Invertebrate fossils through time: **3, 4.** Microfossil diversity and palaeoenvironmental applications | HC | | | 13-19 | PAL seminar room |
| | 15:15 | 17:00 | | | Practical applications of microfossils | HC | 13-19 | SU Geology Dept Rm ??? |
| **Tuesday 4th Feb, 2020** | 10:15 | 12:00 | Palaeozoic vertebrates: **1**. Evolution and diversification of fishes; **2.** vertebrates emerge onto land, the first amphibians; | TM | | | 13-15 | PAL seminar room |
| | 13:15 | 14:00 | Palaeozoic vertebrates: **3**. The first reptiles and differentiation into synapsids, diapsids, anapsids etc | TM | | | 13-15 | PAL seminar room |
| | 14:15 | 16:00 | | | Why we are all fish: Structural homologies in fish and tetrapods | TM | | |
| **Wednesday 5th Feb, 2020** | 10:15 | 17:00 | Individual study time | | | | | |
| **Thursday 6th Feb, 2020** | 10:15 | 12:00 | Mesozoic vertebrate diversification: **1**. marine reptiles; **2**. gliding and flying reptiles | TM | | | 16, 17 | PAL seminar room |
| | 13:15 | 14:00 | Mesozoic vertebrate diversification: **3**. Dinosaur diversity, distribution, ecological specializations and palaeobiology | LW | | | 16, 17 | Edvard Andersons växthus, Bergianska |
| | 14:15 | 16:00 | | | Assessment: Students presentation a critique of a short palaeontological paper | Various staff | | PAL seminar room |
| **Friday 7th Feb, 2020** | 10:15 | 12:00 | Cenozoic vertebrate faunas: **1**. Rise of mammals and birds, case study - carnivores of Africa; **2.** Evolution in isolation - Australian, NZ, Madagascan biotas | LW, SM | | | 18, 19 | PAL seminar room |
| | 13:15 | 15:00 | Cenozoic vertebrate faunas: **3.** Case studies - e.g., Seymour Island; **4.** Miocene European fauna | TM | | | 18, 19 | PAL seminar room |
| | 15:15 | 17:00 | | | Using fossil tetrapods to interpret environments & palaeobiology | TM | | PAL seminar room & collections |
| **8th Feb, 2020** | WEEKEND | | | | | | | |
| **9th Feb, 2020** | WEEKEND | | | | | | | |
| **Monday 10th Feb, 2020** | 10:15 | 12:00 | Evolutionary theory: **1**. Historical concepts of evolution vs modern phylogenetic approaches; **2.** The application of fossils to evolutionary studies | SK | | | 7 | PAL seminar room |
| | 13:15 | 14:00 | Biostratigraphy: **1**. definitions, types of zones, formalizing zones, application of fossils to dating and correlating sedimentary rocks - key biostratigraphically useful fossil groups | SM | | | 6 | PAL seminar room |
| | 14:15 | 17:00 | | | Biostratigraphy-magnetostratigraphy dating and correlation exercises | SM | | PAL seminar room |
| **Tuesday 11th Feb, 2020** | 10:15 | 12:00 | Palaeoclimate: **1.** Approaches to interpreting past climates from fossils - marine proxies; **2.** terrestrial proxies; caveats, sources of error, and margins of uncertainty | MS | | | 4, 10 | PAL seminar room |

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| | 13:15 | 14:00 | Palaeoclimate: **3.** Case studies of palaeoclimate analysis | MS | | | 4, 10 | PAL seminar room |
| | 14:15 | 17:00 | | | Stomatal density & stomatal index practical exercise | MS | | PAL seminar room |
| **Wednesday 12th Feb, 2020** | 10:15 | 12:00 | Biogeography: **1.** Principles, historical biogeography, vicariance, panbiogeography, phylogeography; What controls the distributions of organisms?; **2.** spatial distribution of organisms through time; continental vs marine biogeography | SK | | | 4 | PAL seminar room |
| | 13:15 | 15:00 | No tasks - Industry day afternoon | | | | | |
| | 15:15 | 17:00 | No tasks - Industry day afternoon | | | | | |
| **Thursday 13th Feb, 2020** | 10:15 | 17:00 | Individual study time | | | | | |
| **Friday 14th Feb, 2020** | 10:15 | 12:00 | Palaeoenvironments: **1**. Using fossils to interpret ancient environments - marine systems; **2**. Using fossils to interpret ancient environments - terrestrial systems | CS, SM | | | 4 | PAL seminar room |
| | 13:15 | 15:00 | Molecular fossils: 1, 2, Biomarkers and their applications | RS | | | 4 | PAL seminar room |
| | 15:15 | 17:00 | | | Evolution gallery - constructing an exhibition; what could be improved?; other means of engaging with the public | CS, TD | | Evolution gallery, NRM main building |
| **15th Feb, 2020** | WEEKEND | | | | | | | |
| **16th Feb, 2020** | WEEKEND | | | | | | | |
| **Monday 17th Feb, 2020** | 10:15 | 12:00 | Mass extinctions & radiations: **1.** Great oxidation event; end-Ordovician; Frasnian-Famennian (causes, patterns, tempo, magnitudes and geographic expression); **2.** end-Permian and end-Triassic events | SS, VV | | | 11 to 19 | PAL seminar room |
| | 13:15 | 15:00 | Mass extinctions & radiations: **3.** end-Cretaceous event; **4.** Quaternary extinctions and lessons for the present | VV, SS | | | 11 to 19 | PAL seminar room |
| | 15:15 | 17:00 | | | K-Pg palynology practical exercise | SS | | PAL seminar room |
| **Tuesday 18th Feb, 2020** | 10:15 | 12:00 | Palaeoecology: 1. Interactions at community level - marine and terrestrial; 2. Interactions at individual level | SM | | | 3, 5, 10 | PAL seminar room |
| | 13:15 | 15:00 | Study time to finish off assignment and prepare for exam | | | | | PAL seminar room |
| | 15:15 | 17:00 | | | Submission of short research report and short presentation of individual projects; wrap-up of course | Various staff | | PAL seminar room |
| **Wednesday 19th Feb, 2020** | 10:15 | 12:00 | Exam - mixed short answer & practical exercises | | | | | PAL seminar room |

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| **Lecturer** | | |
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| MS | Margret | Steinthorsdottir |
| CS | Christian | Skovsted |
| SK | Steffen | Kiel |
| CM | Chris | Mays |
| SM | Stephen | McLoughlin |
| VV | Vivi | Vajda |
| SS | Sam | Slater |
| RS | Rienk | Smittenberg |
| CD | Christophe | Duprez |
| MI | Magnus | Ivarsson |
| TS | Therese | Sallstedt |
| TD | Thomas | Denk |
| LW | Lars | Werdelin |
| TT | Timothy | Topper |
| TM | Thomas | Mörs |
| JH | Jonas | Hagström |
| HC | Helen | Coxall |