

# Denver Museum of Nature & Science

## PALEONTOLOGY CERTIFICATION PROGRAM

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### 2011 INFORMATION & COURSE DESCRIPTIONS

The Paleontology Certification Program is for those who wish to learn more about paleontology and develop skills in the collection, preparation, curation, and study of fossils. You may choose from three Certification options: Paleontology Certification, Lab Specialization Certification and Field Specialization Certification.

Course schedules are listed in the Paleontology Certification E-Newsletter and are marked with an asterisk (\*) on our website at under “Classes” at [www.dmns.org/adults](http://www.dmns.org/adults).

### PALEONTOLOGY CERTIFICATION

The Paleontology Certification consists of eight required courses that provide students with an introduction to the history of life as revealed through the fossil record as well as a basic knowledge of the theories and techniques of paleontology.

#### Introductory Courses

##### **Paleontology 101**

*Lou Taylor, PhD, research associate, Earth Sciences Department*

Explore basic concepts of paleontology and geology. Following an introduction on the history of life on Earth, learn how fossils are formed, their scientific value, and the basics of collection and data recovery, curation, and study.

12 course hours + 1 full day field trip, \$150 member, \$180 nonmember

##### **Reading Colorado: An Introduction to the Geology of Colorado**

*Bob Reynolds, PhD, research associate, Earth Sciences Department*

Discover geology fundamentals as applied to the fossil record. Learn the basics of stratigraphy, sedimentology, geological mapping, and dating techniques, and complete a field report. Course includes two full day field trips: one to introduce you to the Denver Basin and to Front Range structure and stratigraphy, while the second will highlight specific sites in central Colorado that are discussed in the classroom.

10 course hours + 2 full day field trips, \$225 member, \$255 nonmember

##### **Paleontology of the Western Interior**

*Kirk Johnson, PhD, vice president and chief curator, Research & Collections Division*

The Western Interior of North America preserves one of the most complete sequences of fossil-rich rock in the world. Explore the fossil treasures of the Rocky Mountain states.

12 course hours, \$110 member, \$140 nonmember

##### **Curation of Fossils**

*Logan Ivy, PhD, collections manager, Earth Sciences Department*

Learn the basics involved in the identification of fossils: accessioning, cataloging, and documenting locality information.

10 course hours, \$110 member, \$140 nonmember

##### **Evolution**

*Richard Stucky, PhD, curator of paleoecology and evolution, Earth Sciences Department*

Evolution is the most important scientific principle in modern science. From understanding the development of the universe to understanding the world's diversity, to understanding human physical and cultural change over time, evolution explains, through the scientific process, how change takes place in the fossil and archaeological record. Examine millions of years of changes in the history of life and how evolution explains them. Begin with the definition of science and why explanations that deny evolution are not compatible with the scientific method.

8 course hours, \$110 member, \$140 nonmember

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### Lecture + Lab Courses (Choose two)

#### **Invertebrate Paleontology I: Precambrian & Paleozoic**

*Emmett Evanoff, PhD, research associate, Earth Sciences Department*

The early stage in the history of invertebrates is represented by the late Precambrian and the Paleozoic, ending with the Permian-Triassic extinction. Trilobites, brachiopods, and crinoids were especially abundant. Examine the fossil groups that were most important during this early stage.

12 course hours (lecture/lab), \$110 member, \$140 nonmember

#### **Invertebrate Paleontology II: Mesozoic & Cenozoic**

*Emmett Evanoff, PhD, research associate, Earth Sciences Department*

The modern groups of abundant invertebrates arose from the ashes of the Permian-Triassic extinction. Groups such as mollusks, crustaceans, and echinoids became dominant, and remain so to the present. Examine the fossil groups that are most important during this second stage of invertebrate history.

12 course hours (lecture/lab), \$110 member, \$140 nonmember

#### **Paleobotany**

*Ian Miller, PhD, department chair and curator of paleontology, Earth Sciences Department*

Nearly 300,000 species of plants live on Earth today. This lively course starts with the first land plants and moves through the 400 million-year history of plant evolution on Earth. Learn the major groups of plants and how fossils allow paleobotanists to reconstruct ancient environments and climates. A field trip to Denver Botanic Gardens provides an opportunity to look at modern plants from the perspective of their ancient history.

8 course hours (lecture/lab) + half-day field trip, \$110 member, \$140 nonmember

#### **Vertebrate Paleontology I: Fishes to Birds**

*Bryan Small, preparator, Earth Sciences Department*

Investigate the origin and evolution of vertebrates excluding mammals and their ancestors. Focus on major evolutionary events and the origins of the major vertebrate groups. Course includes lecture and hands-on lab sessions.

12 course hours (lecture/lab), \$110 member, \$140 nonmember

#### **Vertebrate Paleontology II: Mammals**

*Lou Taylor, PhD, research associate, Earth Sciences Department*

Examine the origin and evolution of mammals. Course includes lecture/lab sessions.

12 course hours (lecture/lab), \$110 member, \$140 nonmember

### Research & Writing Course

It is strongly recommended to complete all other Prerequisite Courses before registering for this course.

#### **Scientific Writing (formerly Research Methods & Report Writing)**

*Whitey Hagadorn, PhD, curator of earth sciences, Earth Sciences Department*

Learn the basics of scientific writing for field, laboratory, and scientific projects in paleontology. Attendance for each session is mandatory. Students write a research proposal and a report on a project of their choice.

8 course hours

\$110 member, \$140 nonmember

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### LAB SPECIALIZATION CERTIFICATION

After you have completed the Paleontology Certification, there are two specialized tracks you may choose to pursue. Students who have a greater interest in fossil preparation may receive a Paleontology Lab Specialization Certificate by completing an additional hands-on Laboratory Methods course.

#### Lab Methods in Paleontology

*Heather Finlayson, assistant preparator, Earth Sciences Department*

Learn and practice the techniques of fossil preparation; preservation, and conservation in the hand-on course.

Students who successfully complete this course are eligible to volunteer in the lab and assist in cleaning and preparing fossils collected by Museum researchers and volunteers. Students must be 17 years of age or older.

16 lab hours

\$160 member, \$190 nonmember

### FIELD SPECIALIZATION CERTIFICATION

Students with a particular interest in field work may receive a Paleontology Field Specialization Certificate by completing additional related classroom programs, as well as by participating in six days of field work.

#### Sedimentology & Stratigraphy

*Whitey Hagadorn, PhD, curator of earth sciences, Earth Sciences Department*

Learn the principles and practices of interpreting sedimentary rocks and stratigraphic sequences. This course also includes practical experience reading maps, measuring stratigraphic sections, and using geologic field equipment.

Sedimentology & Stratigraphy is the prerequisite course for Field Methods in Paleontology.

18 course hours (lecture/lab) + 2 full day field trips

\$225 member, \$255 nonmember

#### Field Methods in Paleontology

This is your chance to take part in field research and explore the floras, faunas, and geology of the Rocky Mountain Interior with the Museum's scientists! This year's field school will be in the Wind River Basin, Wyoming. Surrounded by mountain ranges of Precambrian to Paleocene rocks that were exposed during the Eocene Epoch, the Wind River Basin is an area rich with fossil vertebrates and fossil plants from 52 to 40 million years ago. Ancient river channels and flood plain sediment have preserved tropical rainforest mammals, reptiles, and plants. This course includes instruction on the techniques of fossil collection and geological field methods with a focus on understanding the relationship between geology and paleontology.

Instructors include: Bob Reynolds, PhD, Research Associate and Geologist; Heather Finlayson, Assistant Preparator; and Richard Stucky, PhD, Curator of Paleoecology and Evolution.

Prerequisites include the following three Paleontology Certification Program courses: Paleontology 101, Reading Colorado: An Introduction to Geology, and Sedimentology & Stratigraphy. Prior experience in geology may serve as a substitute for the prerequisites.

Price includes 6 days field instruction and meals. You will need to provide your own tent, sleeping bag, and transportation to the site. More information and directions will be provided after you register.