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**Department of …Earth Sciences and Petroleum…………………….**

**College of …Science…………………………….**

**University of Salahaddin………………………….**

**Subject: ……Micropaleontology…………………………….**

**Course Book – (Year 3)**

**Lecturer's name Ali Ashoor AbidPhD**

**Academic Year: 2022/2023**

**Course Book**

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| **1. Course name** | **Micropaleontology** |
| **2. Lecturer in charge** | **Dr. Ali Ashoor Abid** |
| **3. Department/ College** | **Geology / Science** |
| **4. Contact** | **Ali.abid@su.edu.krd****07504133741** |
| **5. Time (in hours) per week**  |  **Theory: 2** **Practical: 8**  |
| **6. Office hours** | **Sunday, 4 hours** |
| **7. Course code** |  |
| **8. Teacher's academic profile**  | **BSc 1979 , Msc 1983, PHd 1997 : all from College of Science , University of Baghdad.****Assistant Lecturer 1984; Lecturer 1990 ;Assistant Professor 1999**  |
| **9. Keywords** |  |
| **10. Course overview:** This subject deals with the nature of microfossils; hence its main concern is the specimen as seen down the microscope, considered as a once-living organism. The naming of parts, which is the first essential step, precedes the naming and classification of the specimen, in which a number of genera are described briefly and accompanied by labeled line drawings such as the student, may prepare himself. More derivative data, as for the general history of a group, are broadly sketched but the all-important matter of their geological applications is covered for each group in the form of an “animated” reference list, turning students towards books or articles of special interest. We envisioned a college-level introductory text, including all microfossil groups used in the study of the marine environment. We hoped to provide a source for basic information on each group, for comprehension of the type of reasoning applied to the study of microfossils and their use in (paleo)oceanography, and for locating essential background material and references necessary to pursue any group further. As recent advances in micropaleontology continue to transform what was predominantly a descriptive to a more interpretive science vital to (paleo)oceanography research, the number of researchers interested in its applications, especially in the age determination of sediments has increased. Thus in several graduate schools of Earth Sciences and Oceanography, Micropaleontology is a course required of all students. We hope that, in addition to the beginning students of micropaleontology, non-micropaleontologists ( e.g.  Sedimentologists, core-describers, shipboard geophysicists) may produce reasonable estimates of the age of sediments from the stratigraphic range-charts. |
| **11. Course objective:** By definition **micropaleontology**,the study of microscopic fossils, cuts across many classificatory lines. It includes within its domain the study of large numbers of taxonomically unrelated groups united solely by the fact that they must be examined with a microscope. At the same time within certain taxonomically homogeneous groups the size of some forms is such that they scarcely need be examined with microscopic aid and are more properly grouped under macropaleontology. It is not surprising then that as a discipline micropaleontology lacks a certain coherent homogeneity. Most marine microfossils are protists (unicellular plants and animals),but others are multicellular or microscopic parts of macroscopic forms. The practical value of marine microfossils in various fields of historical geology is enhanced by their minute size, abundant occurrence and wide geographic distribution in sediments of all ages and in almost all marine environments. Due to their small size and large numerical abundance, relatively small sediment samples can usually yield enough data for the application of more rigorous quantitative methods of analysis.  |
| * **12. Student's obligation** Always, be present in the hall before the instructor
* You must close mobile before entering the hall
* You must be ready to hear the lecture
* You must sit down and don’t talk especially during explanation
* You must discuss and ask about all informations that you can’t understand
* Always, you must read the required or text books to compare with lecture that you receive

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| * **13. Forms of teaching**
* Power Point presentations
* Explanations on blackboard
* Classroom discussions
* Polarized and Binocular Microscope (practical part)
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| **14. Assessment scheme**  Theoretical part equals **15%;** this degree will be approached byat least two examinations in addition to quizzes plus the degree of the scientific trip. Sometimes the activity of the students within the classroom is evaluated and counted with the above-mentioned degree. Practical part takes **35%** (details are shown in attached papers of practical part). Final Examination: **50% only theoretical** **In addition to the above-mentioned gradings, we have many different quizzes during some the lecture time . The most important thing to evaluate the levels of students , is the scientific trip which deserves report of 100%.**‌ |
| **15. Student learning outcome:**s followed the oil companies those work in the Kurdistan Region especially in the ‌Most of the graduated student  |
| **16. Course Reading List and References‌:** **Main Text Books**Haq,B.U.and Boersma,A.,1978 : Introduction to marine micropaleontology.Elsevier. New York.376p.Brasier,M.D.,1980 : Microfossils. George Allen and Unwin. London, Boston, Sydney.193p.Bignot,G.,1985: Elements of micropalaeontology. Graham and Trotman.217p.Armstrong,H.A. and Brasier,M.D.,2005: Microfossils (Second Edition).Blackwell Publishing.296p.  **Additional References** Loeblich,A.and Tappan,H.,1964: Sarcodina,Chiefly “Thecamoebians” and Foraminiferida.In Moore,R.C.(ed.),Treatise on Invertebrate Paleontology. Geol.Soc.Amer.and Univ.Kansas,part C,Protista 2(1,2).C1-C900.Banner,F.T.and Lord,A.R.,1982: Aspects of micropaleontology. George Allen and Unwin.London,Boston,Sydney.324p.   **Journals and Bulletins**MicropaleontologyMarine MicropaleontologyBull.Utrecht Micropaleontology Journal of PaleontologyProceedings.Kon.Ned.Akad.Wet.Contribution of Cushman Foundation of Foraminiferal ResearchJournal of Foraminiferal Research Bull.American Association of Petroleum GeologistsMarine GeologyBull.Geological Society of AmericaAmerican Journal of SciencePalaeogeography,Palaeoclimatology,PalaeoecologyJournal of Sedimentary PetrologyJournal of Geology, Nature, Proceedings of the Conferences |
| **17. The Topics:** | **Lecturer's name** |
|  **Course Program****Week 1 – Marine Micropaleontology** Introduction; Importance of Micropaleontology; Microfossils-What are they?;Why study microfossils?;Methods of isolation of microfossils;The kingdoms of life; the bases of classification of organisms**Week 2,3,4- Foraminifera**Introduction; History of foraminiferal research; Systematic position; The cell and its contents; The living animal (Nutrition, Movement, Reproduction); Test morphology; General description of the foraminiferal test : 1.Wall structure 2.Overall shape 3.Shape and arrangement of chambers 4.Apertures 5.Sutures 6.Ornamentation;Evolution lines of Foraminifera; Classification, ancient and modern;Paleoecology, different factors; Stratigraphic distribution and Geologic history.**Week 5 – First Examination****Week 6,7- Larger Foraminifera**Rank of forms; Classification; Family **Fusulinidae** : General characters, Wall structure, Septa, Shape of the test, Size of the test, Evolutionary Trends, Classification, Geological distribution; Family**Lepidocyclinidae**: General description, Embryonic and periembryonicChambers,Evolutionary and systematic importance of theEmbryonic chambers; Family **Discocyclinidae**: General description,Types of embryonic chambers; Family **Nummulitidae**: GeneralDescription, Classification according to arrangement of median layer, Types of septal filaments on ***Nummulites*** tests, Phylogeny and stratigraphic distribution of some Nummulitidae genera ; Family **Miogypsinidae**: General description, Recognition of forms  On the level of genera and subgenera; Family **Alveolinidae** : General description, Axial elongation, Classification according to the Internal structure.**Week 8,9- Ostracoda**Systematic position; Comparison between Foraminifera and  Ostracoda; General characters; Soft body structure; Hard parts; Ostracod carapace (inner lamella-outer lamella),Factors affect the Shape of carapace; Muscle scars; Hingement, different types; Orientation of the carapace(Anterior and Posterior,Dorsal and Ventral); Larval stages; Sexual dimorphism; Paleoecology; Bases of classification.**Week 10 – Second Examination****Week 11,12- Spores and Pollen**Introduction; Palynology- definition, groups, importance; Pollen;Spores; Morphology, Distinguishing criteria for pollen (size, shape,apertures, sculpture, wall structure),Spore characteristics( basicshape, types of meiosis and production of spores, size, apertures,wall structures, sculpture.**Week 13- Group Acritarcha**Introduction; Nature and systematic of the Acritarchs; Main characteristics; Morphology(Main parts of the standard shape ofAcritarchs, The Vesicle);Different groups of Acritarch according toThe shape and symmetry of body; Wall structures (cross sectionsin Acritarch genera to show different shapes of the wall); Types of Processes; Types of Central body; Main parts of standard Process in Acritarch (Base, Cavities, Stem, Tips, Branching);Ornamentation; Classification, Bases; Important criteria for defining species and genera, **Week 14 - Third Examination** | Dr.Ali Ashoor Abid (2 hrs) |
| **18. Practical Topics (If there is any)** |  |
| In this section The lecturer shall write titles of all practical topics he/she is going to give during the term. This also includes a brief description of the objectives of each topic, date and time of the lecture  | M. Erfan Shaaban Asaad |
| **19. Examinations :** - Mention all bases of classification of Paleontology - List all groups of Cacareous Microfossils- Give the correct systematic position of Ebridians- List all groups of Phosphatic Microfossils- Classify Foraminifera according to the nimber of chambers with examples and drawings- What are the values of Salinity with terms for the brackish waters of Kinne Classification 1964- Embryonic chambers are very important factor to classify individuals of Larger Foraminifera : Mention all families those have these types of chambers with all details and drawings- Classify Pore Canals of Ostracoda with drawings - Draw with terms all types of Apertures in Spores and Pollen - Draw the typical parts of the Process of Acritarchs  23 |
| **20. Extra notes: No** |
| **21. Peer review پێداچوونه‌وه‌ی هاوه‌ڵ** This course book has to be reviewed and signed by a peer. The peer approves the contents of your course book by writing few sentences in this section.*(A peer is person who has enough knowledge about the subject you are teaching, he/she has to be a professor, assistant professor, a lecturer or an expert in the field of your subject).*ئه‌م کۆرسبووکه‌ ده‌بێت له‌لایه‌ن هاوه‌ڵێکی ئه‌کادیمیه‌وه‌ سه‌یر بکرێت و ناوه‌ڕۆکی بابه‌ته‌کانی کۆرسه‌که‌ په‌سه‌ند بکات و جه‌ند ووشه‌یه‌ک بنووسێت له‌سه‌ر شیاوی ناوه‌ڕۆکی کۆرسه‌که و واژووی له‌سه‌ر بکات.هاوه‌ڵ ئه‌و که‌سه‌یه‌ که‌ زانیاری هه‌بێت له‌سه‌ر کۆرسه‌که‌ و ده‌بیت پله‌ی زانستی له‌ مامۆستا که‌متر نه‌بێت.‌‌  |

