**Ministry Of Higher Education and Scientific Research**

**Mustansiriyah University/College of Science/Department of Computer Science**

**(الخطة الدراسية للمساق )**

***Course Plan***

|  |  |
| --- | --- |
| **Course No.: 508631012** | **Course Name: Atmospheric Forecasting1** |
| **Academic Year:   2018-2019** | **Time Division: 2hr Theoretical & 2hr Practical** |

**Course Description :**

|  |
| --- |
| This Annual course is a specific in weather forecasts, which is based on understanding the role of the long wave, geostrophic and thermal wind in weather forecasting. and methods used in forecasting by Vorticity, vertical motion and fronts, depending on the analysis of weather maps, and on reviewing the equations and physical laws which is controlling these phenomena in upper and lower troposphere . **Course Intended Outcomes :** |
| At the end of the course, students are expected to learn:  Determining the long waves .   * how to use the weather maps to calculate the vertical motion. * what is the role of thermal wind in weather predictions . * the relation between geostrophic wind and forecasting in fronts. |

# Course Outline:

|  |  |
| --- | --- |
| **Week** | **Description depends on the Timing table (Theoretical & Practical)** |
| **1** | **Forecasting by Vorticity : part 1**  Definition of Rossby index (parameter), the relation between Rossby parameter and Vorticity. |
| **2** | **Forecasting by Vorticity : part 2**  Driving Rossby index from absolute Vorticity. |
| **3** | **Forecasting by Long Waves: part 1**  What are the long waves, characteristics of long waves, methods of determining the long waves. |
| **4** | **Forecasting by Long waves:** **part 2**  The importance of long waves, driving the velocity of long waves, the proprieties of Rossby waves. |
| **5** | **Forecasting by Vertical Motion:** **part 1**  Determinants vertical motion, the reasons of generation vertical motion and development**,** Calculate the vertical motion dynamically & adiabatically Vertical wind motion. |
| **6** | **Forecasting by Vertical Motion: part 2**  the relationship of divergence (or convergence) in vertical motion, predicting by using the vertical motion |
| **7** | **EXAM 1** |
| **8** | **Geostrophic & Thermal wind: part 1**  Geostrophicwind definition, thermal wind definition,thermal geostrophic wind equation. |
| **9** | **Geostrophic & Thermal wind: part 2**  the importance of thermal wind, thickness equation. |
| **10** | **Forecasting by Thermal wind: part 1**  The determinants of the using thermal wind equation, Practical formulas to the thermal geostrophic wind. |
| **11** | **Forecasting by Thermal wind: part 2**  Predicting using the thermal wind. |
| **12** | **Fronts equilibrium: part 1**  What is fronts equilibrium, the relationship between pressure gradient and front gradient. |
| **13** | **Fronts equilibrium: part 2**  The relationship between front gradient and the geostrophic wind, the relationship between front gradient and temperature. |
| **14** | **EXAM 2** |

**Textbooks:**

|  |
| --- |
| 1. Weather Analysis & forecasting, T. Vasquez, Weather Graphics Technologies, 2011. 2. Weather Analysis and Forecasting, S, Petterssen, McGraw-Hill; First Edition, 1956. 3. تجارب عملية في الرصد والتحليل والتنبؤ الجوي، منعم حكيم خلف، سناء عباس عبد الجبار، مؤسسة مصر مرتضى للكتاب العراقي للنشر، مطبعة جعفر العصامي، بغداد، 2010. |

**Suggested references:**

|  |
| --- |
| 1. Weather Forecasting Handbook, Tim Vasques, Fifth Edition,2002. 2. Compendium of meteorology,WMO,NO.364,1978. 3. Principles of Meteorological Analysis, Walter J.Saucier, University of Chicago Press,1955. 4. Weather Analysis and Forecasting, S, Petterssen, McGraw-Hill; First Edition, 1956. 5. فيزياء الجو والفضاء، الجزء الأول، الأنواء الجوية، الباحث العلمي د.حميد مجول، أ.م فياض عبد اللطيف النجم، الطبعة الأولى، 1982. 6. خرائط الطقس والتنبؤ الجوي، د.حازم توفيق، ماجد السيد ولي محمد ، 1985. 7. الجو عناصره وتقلباته، عبد الغني سلطان، 1985. 8. الرصد والتنبؤ الجوي، الدكتور علي حسين موسى,1986. 9. الطقس والمناخ والأرصاد الجوية ، خروسوف س.ب ، 1968. |

**Marking:**

|  |  |
| --- | --- |
| **First Semester** | **Final Exam** |
| |  |  |  |  | | --- | --- | --- | --- | | **1st exam** | **2nd exam** | **Practical** | **Activity** | | **14** | **14** | **10** | **2** | | |  | | --- | |  |   60 |

**Assignments and/or Projects:**

|  |  |  |  |
| --- | --- | --- | --- |
| **Assignment/Project** | **Description** | **Due Date** | **Marking** |
| H.W | answering a series of questions with the end of each a week semester | During the course | 1 |
| Quizzes | Two or more quizzes | During the course | 1 |

**Instructor information:**

|  |  |  |
| --- | --- | --- |
| Lecture Room No.: [ 204 ] | Time:  **TUS, 8:30-12:30** | |
| Instructor's Name *Dr. Hazim H. Hussain Al-Saleem* | | Office No.: **5** | | |
| E-Mail: [*Dr.Hazim@uomustansiriyah.edu.iq*](mailto:Dr.Hazim@uomustansiriyah.edu.iq)  ***NOTES:***   * ***Office Hours: Other office hours are available by appointment.*** * ***The content of this syllabus not be changed during the current semester.*** | | | |  |

**Lecturer Signature ** Chairman Signature**