



## Module Description

**University of AL-Kafeel / College..... Academic Year (2020-2021)**

|                                       |  |
|---------------------------------------|--|
| <b>Stage:</b>                         | Second stage   |
| <b>Specialization:</b>                | Pharmacy   |
| <b>Name of the Course in Arabic</b>   | الصيدلة الفيزيائية I   |
| <b>Name of the Course in English</b>  | Physical Pharmacy I  |
| <b>Goals:</b>                         | Teaching the physical, mathematical and chemical basis of all the physical and chemical phenomena of substances in their solid, liquid and gas states, as it helps to predict the solubility and compatibility of medicinal products and thus assist in the formation of new drugs and dosage forms.   |
| <b>Description</b>                    | To understand the application of quantitative and theoretical principles of the physical characters of matter in the practice of pharmacy. It aids the pharmacists in their attempt to predict the solubility, compatibility and biological activity of drug products. As a result of this knowledge it will help in the development of new drugs and dosage forms as well as in improvement of various modes of administration. |
| <b>Number of Theoretical lectures</b> | Theory 3   |
| <b>Number of Practical lectures</b>   | Laboratory 2   |
| <b>Credits</b>                        | 4  |
| <b>Name of Instructor in Arabic</b>   | قاسم علاوي بدر جابر (نظري) , محمد حمزة حرز (عملي)  |
| <b>Name of Instructor in English</b>  | Qasim Allawi Bader Jaber<br>Mohammed hamza   |
| <b>Title</b>                          | مدرس , مدرس مساعد  |
| <b>Academic email:</b>                | <a href="mailto:Qasim.allawi@alkafeel.edu.iq">Qasim.allawi@alkafeel.edu.iq</a><br><a href="mailto:mohammedhamza@alkafeel.edu.iq">mohammedhamza@alkafeel.edu.iq</a>   |

**Curriculum / Theoretical:**

| Week | Syllabus  |
|------|---|
| 1    | States of matter, binding forces between molecules, gases, liquids, solid and crystalline matters; phase equilibria and phase rule; thermal analysis.   |
| 2    | Thermodynamics, first law, thermochemistry, second law, third law, free energy function and applications.   |
| 3    | Solutions of non-electrolytes, properties, ideal and real colligative properties, molecular weight determination.   |
| 4    | Solution of electrolytes, properties, Arrhenius theory of dissociation, theory of strong electrolytes, ionic strength, Debye-Huckle theory, coefficients for expressing colligative properties. |
| 5    | Ionic equilibria, modern theories of acids, bases and salts, acid-base equilibria, calculation of pH, acidity constants, the effect of ionic strength and free energy.                          |
| 6    | Buffered and isotonic solutions: Buffer equation; buffer capacity; methods of adjusting tonicity and pH; buffer and biological system.  |
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### Curriculum / Practical:

| Week | Syllabus  |
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| 1    | Expression of concentrations in pharmaceutical preparations             |
| 2    | Two component systems containing liquid phases.                         |
| 3    | Three component systems.  |
| 4    | Tie linear for three component systems.                                 |
| 5    | Partition coefficient: Measurements and evaluation.                     |
| 6    | Solubility methods.   |
| 7    | Buffer solutions.   |
| 8    | Determination of solubility product constant of slightly soluble salts. |
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### References :

#### Main References :

- [1] Physical Pharmacy by Alfred Martin et al; (Latest edition).
- [2] Lab Manual for Practical Physical pharmacy Adopted by the Department

[2]

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#### Secondary References:

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