# Course Syllabus (Academic Year 2021)

## School of Interdisciplinary Studies, Kanchanaburi Campus, Mahidol University

1. **Course No. and Title** : KAFT 325 Food Analysis

   **Credit (study hours)** : 4 (3-3-7)

2. **Program Name** : Bachelor of Science in Food Technology

3. **Course Module** : Specific Core Course, Required Subject

   **Pre/co-requisite** : KAID 222 Analytical Chemistry, KAFT 320 Food Chemistry I

4. **Class Semester** : ☐ 1st Semester ☑ 2nd Semester Academic Year 2021

5. **Class Schedule & Venue** : Thursday, 9.00-12.00 and 13.00-16.00

   Lecture: Hybrid classroom (onsite at Room XXX and online)

   Laboratory: Room L-112/ L-305/ CIF room, Laboratory Building

6. **Class Coordinator** : Assoc. Prof. Dr. Rungtiwa Wongsagonsup

   Contact No. : 082-470-7341 Email : rungtiwa.won@mahidol.ac.th

7. **Course Description**

Principles, methods, and practices on the determination of food constituents; nutritional labeling; the determination of food quality in physical and chemical aspects; principle of spectroscopy; principle of chromatography; ethical awareness; work effectively with others

8. **Course Objectives / Course Learning Outcomes (CLOs)**

| No. | Objectives / CLOs | Expected Skills / Knowledge | | | PLOs |
|---|---|---|---|---|---|
| | | Specific | Generic | Knowledge | |
| 8.1 | Explain the principles behind analytical methods associated with food | S6 | G2 | K17 | 1 |
| 8.2 | Select the appropriate laboratory technique when presented with a practical problem | S6 | G1 | K17 | 2 |
| 8.3 | Demonstrate practical proficiency in a food analysis laboratory | S7 | G3, G7 | K17 | 2 |
| 8.4 | Demonstrate the use of oral and written communication skills and show cooperative teams | - | G10, G13-G16 | K25, K26 | 4, 5 |

**Note:** S6, Skill in selecting appropriate analytical techniques; G2, Information acquisition; K17, Analysis of food properties; G1, Decision making; S7, Skill in conducting analytical procedure; G3, Ethics; G7, Time management; G10, Communication skill; G13, Writing skill; G14, Presentation skill; G15, Interpersonal skill; G16, Teamwork; K25, Thai language for communication; K26, English language for communication

**9. Class Instructor List**

| | |
|---|---|
| 9.1 Name : Assoc. Prof. Dr. Rungtiwa Wonsagonsup (RW) | Email : rungtiwa.won@mahidol.ac.th |
| 9.2 Name : Dr. Renoo Yenket (RYK) | Email : ryenket@gmail.com |
| 9.3 Name : Dr. Natteewan Udomsil (NU) | Email : paeng888@hotmail.com |
| 9.4 Name : Asst. Prof. Dr. Jarupat Luecha (JL) | Email : jarupat.lue@mahidol.ac.th |
| 9.5 Name : Dr. Chutikarn Kapcum (CK) | Email : kapcum.chu@gmail.com |
| 9.6 Name : Dr. Patnarin Benyathiar (PB) | Email : ohnarin@gmail.com |
| 9.7 Name : Dr. Netiya Karaket (NK) | Email : netiya.kar@mahidol.ac.th |
| 9.8 Name : Asst. Prof. Dr. Nongnuch Sangayut (NS) | Email : nongnuchts@gmail.com |
| 9.9 Name : Ms. Kannika Pasada (KP) | Email : kannika.pas@mahidol.ac.th |
| 9.10 Name : Ms. Phirata Khunoat (PK) | Email : phirata.khu@mahidol.ac.th |

**10. Course Outline**

| Week | Date | Contents | CLOs | Teaching & Learning | Instructor's Names |
|---|---|---|---|---|---|
| 1 | THU 06/01/22 | Lecture: - Course introduction<br>- Titratable acidity and pH | 8.1-8.2 | Lecture | RW |
| | | Lab: Titratable acidity and pH | 8.2-8.4 | Laboratory | RW, PB, KP |
| 2 | THU 13/01/22 | Lecture: - Evaluation of analytical data<br>- Sampling and sample preparation | 8.1-8.2 | Lecture | RYK |
| | | Lab: Proximate: Moisture and total solid | 8.2-8.4 | Laboratory | RW, CK, KP |
| 3 | THU 20/01/22 | Lecture: Proximate analysis I | 8.1-8.2 | Lecture | RW |
| | | Lab: Proximate: Nitrogen and crude protein | 8.2-8.4 | Laboratory | RW, CK, KP |
| 4 | THU 27/01/22 | Lecture: Proximate analysis II | 8.1-8.2 | Lecture | RW |
| | | Lab: Proximate: Crude lipid (Soxhlet method) | 8.2-8.4 | Laboratory | RW, CK, KP |
| 5 | THU 03/02/22 | Lecture: Proximate analysis III | 8.1-8.2 | Lecture | RW |
| | | Lab: Proximate: Ash | 8.2-8.4 | Laboratory | RW, CK, KP |

| Week | Date | Contents | CLOs | Teaching & Learning | Instructor's Names |
|---|---|---|---|---|---|
| 6 | THU 10/02/22 | Lecture: Vitamin and mineral analyses | 8.1-8.2 | Lecture | RW |
| | | Lab: Proximate: Crude fiber | 8.2-8.4 | Laboratory | RW, CK, KP |
| 7 | THU 17/02/22 | Lecture: Nutritional labeling | 8.1-8.2 | Lecture | RYK |
| | | Lab: Nutritional labeling | 8.2-8.4 | Laboratory | RYK, KP |
| 8 | THU 24/02/22 | Lecture: Antioxidant analysis | 8.1, 8.2 | Lecture | CK |
| | | Lab: Determination of total phenolic content and antioxidant capacity | 8.2-8.4 | Laboratory | CK, KP |
| 9 | | Mid-term Examination (28/02/22-04/03/22) | | | |
| 10 | THU 10/03/22 | Lecture: Electrophoresis analysis | 8.1, 8.2 | Lecture | NU |
| | | Lab: Sect. 1: Protein analysis using electrophoresis<br>Sect. 2: Determination of pesticide residue in vegetables using GC | 8.2-8.4 | Laboratory | NU, KP<br>NK, KP, PK |
| 11 | THU 17/03/22 | Lecture: Analysis of pesticide, mycotoxin and drug residues in foods | 8.1-8.2 | Lecture | NK |
| | | Lab: Sect. 1: Determination of pesticide residue in vegetables using GC<br>Sect. 2: Protein analysis using electrophoresis | 8.2-8.4 | Laboratory | NK, KP, PK<br>NU, KP |
| 12 | THU 24/03/22 | Lecture: Analysis of physical properties I | 8.1, 8.2 | Lecture | JL |
| | | Lab: Sect. 1: Viscosity using Brookfield viscometer<br>Sect. 2: Color analysis | 8.2-8.4 | Laboratory | JL, PB, KP<br>CK, PB, KP |
| 13 | THU 31/03/22 | Lecture: Analysis of physical properties II | 8.1, 8.2 | Lecture | JL |
| | | Lab: Sect. 1: Color analysis<br>Sect. 2: Viscosity using Brookfield viscometer | 8.2-8.4 | Laboratory | CK, PB, KP<br>JL, PB, KP |
| 14 | THU 07/04/22 | Lecture: Chromatography | 8.1-8.2 | Lecture | CK |
| | | Lab: Sect. 1: Texture analysis<br>Sect. 2: Determination of lactic acid content in drinking yoghurt using HPLC | 8.2-8.4 | Laboratory | RW, PB, KP<br>CK, KP, PK |

| Week | Date | Contents | CLOs | Teaching & Learning | Instructor's Names |
|---|---|---|---|---|---|
| 15 | THU 21/04/22 | Lecture: Spectroscopy | 8.1-8.2 | Lecture | NS |
| | | Lab: Sect. 1: Determination of lactic acid content in drinking yoghurt using HPLC<br>Sect. 2: Texture analysis | 8.2-8.4 | Laboratory | CK, KP, PK<br>RW, PB, KP |
| 16 | THU 28/04/22 | Paper presentation | 8.4 | Presentation | All class instructors |
| | | Lab: Lab discussion and wrap up | 8.2-8.4 | Laboratory | RW, KP |
| 17 | Final Examination (02-13/05/22) | | | | |
| 18 | | | | | |

**11. Course Assessment**

| No. | Methods / Activities | Regulations | CLOs | Week | Weight Distribution (%) |
|---|---|---|---|---|---|
| 11.1 | Mid-term exam | - Closed book<br>- Calculator is allowed | 8.1, 8.2 | 1-8 | 30 |
| 11.2 | Final exam | - Closed book<br>- Calculator is not allowed | 8.1, 8.2 | 10-15 | 30 |
| 11.3 | Reports | Laboratory reports | 8.3, 8.4 | 1-8, 10-15 | 20 |
| 11.4 | Paper presentation | Group presentation<br>- 2 students for each group<br>- 10 min for presentation and 5 min for Q&A | 8.4 | 16 | 10 |
| 11.5 | Quiz / Assignments | Written quizzes<br>Group assignment | 8.1, 8.2, 8.4 | 1-8, 10-15 | 5 |
| 11.6 | Class participation | Instructor evaluation of class participation | 8.3, 8.4 | 1-8, 10-16 | 5 |
| | | | | **Total** | **100** |

**12. Grading System**

☑ Criterion-referenced evaluation

| Grade | Score | Grade | Score | Grade | Score | Grade | Score |
|---|---|---|---|---|---|---|---|
| A | ≥ 80 % | B | 70 – 74.99% | C | 60 – 64.99% | D | 50 – 54.99% |
| B+ | 75 – 79.99% | C+ | 65 – 69.99% | D+ | 55 – 59.99% | F | < 50 % |

☐ Norm-referenced evaluation

*If use both criterion and norm-referenced evaluation, please tick two boxes.

**13. References**


13.1 ลักขณา รุจนะไกรกานต์ และ นิธิยา รัตนาปนนท์ (2544). หลักการวิเคราะห์อาหาร. ภาควิชาวิทยาศาสตร์และเทคโนโลยีการอาหาร คณะเกษตรศาสตร์ มหาวิทยาลัยเชียงใหม่

13.2 Association of Official Analytical Chemists (1997). Official Methods of Analysis. 16th ed. Association of Official Chemists. USA.

13.3 Jame, C.S. (1995). Analytical Chemistry of Foods. Chapman & Hall, Oxford.

13.4 Nelsen, S.S. (1998). Food Analysis. 2nd ed. Aspen Publishers, Maryland, USA.

13.5 Pearson, D. (1973). Laboratory Techniques in Food Analysis. 1st ed. John Villey Publishers, London.

13.6 Pearson, D. (1976). The Chemical Analysis of Foods. 7th ed. Churchill Livingstone, London.

13.7 Pomeranz, Y. and Meloan, C.E. (1994). Food Analysis: Theory and Practice. 3rd ed. Chapman & Hall, USA.