Subject Description Form

Subject Code	ABCT3624
Subject Title	Chromatographic Analysis
Credit Value	3
Level	3
Pre-requisite	Chemical Principles for Testing and Analysis
Objectives	This module aims to educate students to understand the principles and applications of various chromatographic techniques.
Intended Learning Outcomes	Upon completion of this subject, students will be able to: a. demonstrate a good understanding on the working principles and applications of various chromatographic techniques; b. recognize the advantages and limitations of each chromatographic technique; c. demonstrate practical proficiency in a chemical testing laboratory; d. apply the knowledge gained to solve common and practical problems in chemical analysis.
Subject Synopsis/ Indicative Syllabus	<u>General Principles and Basic Techniques of Separation</u> Filtration; Crystallization; Distillation; Extraction; Paper Chromatography; Thin-layer Chromatography; Column Chromatography. <u>High-Performance Liquid Chromatography</u> Basic instrumentation; silica gel, bonded phase normal and reverse-phase packings; UV, fluorescence and MS detectors; Ion-exchange, size-exclusion, and affinity chromatography; new liquid chromatographic techniques. <u>Gas Chromatography</u> Basic instrumentation; types of columns; choice of stationary phases; properties of thermal-conductivity, flame ionization and electron capture detectors; temperature-programming; qualitative and quantitative analytical methodology. <u>Fundamentals of Chromatography</u> The chromatographic process; capacity factor and retention times; column efficiency and resolution; general chromatographic theory. <u>Sample Preparation for Chromatographic Analysis</u> Homogenization; extraction; cleanup.
Teaching/Learning Methodology	**Lecture**: basic principles will be introduced and discussed. Examples will be used to illustrate the applications of various techniques. **Tutorials:** a set of tutorial problems will be given to allow students to apply the knowledge acquired from the lecture. Students are encouraged

<table>
<tr><td></td><td>to solve the problems before seeking assistance. These will help students consolidate what they have learned and develop a deeper understanding of the subject.</td></tr>
<tr><td>Assessment Methods in Alignment with Intended Learning Outcomes</td><td>
<table>
<tr><td rowspan="2">Specific assessment methods/tasks</td><td rowspan="2">% weighting</td><td colspan="6">Intended subject learning outcomes to be assessed (Please tick as appropriate)</td></tr>
<tr><td>a</td><td>b</td><td>c</td><td>d</td><td></td><td></td></tr>
<tr><td>1. Exam</td><td>70</td><td>√</td><td>√</td><td>√</td><td>√</td><td></td><td></td></tr>
<tr><td>2. Test</td><td>30</td><td>√</td><td>√</td><td>√</td><td>√</td><td></td><td></td></tr>
<tr><td>Total</td><td>100 %</td><td colspan="6"></td></tr>
</table>

Explanation of the appropriateness of the assessment methods in assessing the intended learning outcomes:
Test and examination are used to evaluate how much students have learned in principles and applications of various techniques.</td></tr>
<tr><td>Student Study Effort Required</td><td>
<table>
<tr><td>Class contact:</td><td></td></tr>
<tr><td>▪ Lecture</td><td>33 Hrs.</td></tr>
<tr><td>▪ Tutorial</td><td>6 Hrs.</td></tr>
<tr><td>Other student study effort:</td><td></td></tr>
<tr><td>▪ Self study</td><td>72 Hrs.</td></tr>
<tr><td>Total student study effort</td><td>111 Hrs.</td></tr>
</table>
</td></tr>
<tr><td>Reading List and References</td><td><u>Essential:</u>
Skoog, D. A.; Holler, F. J. and Nieman, T. A.
Principles of Instrumental Analysis (6th ed.) Brooks/Cole 2007.

<u>Supplementary:</u>
Braun, R. D.
Introduction to Instrumental Analysis. Pharma Book Syndicate 2006.

Rubinson K. A. and Rubinson J. F.
Contemporary Instrumental Analysis. Prentic Hall 2000.</td></tr>
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