# Subject Description Form

<table>
<thead>
<tr>
<th><strong>Subject Code</strong></th>
<th>COMP4142</th>
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</thead>
<tbody>
<tr>
<td><strong>Subject Title</strong></td>
<td>E-Payment and Cryptocurrency</td>
</tr>
<tr>
<td><strong>Credit Value</strong></td>
<td>3</td>
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<tr>
<td><strong>Level</strong></td>
<td>4</td>
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<tr>
<td><strong>Pre-requisite / Co-requisite / Exclusion</strong></td>
<td>Pre-requisite: COMP 3334</td>
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</tbody>
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## Objectives

To understand the technologies and applications for e-payment and cryptocurrency.

Specifically, the students should:

- understand fundamental security technologies for supporting e-payment and cryptocurrency;
- evaluate different types of payment methods; and
- understand the design and application of e-payment and cryptocurrency systems.

## Intended Learning Outcomes

Upon completion of the subject, students will be able to:

### Professional/academic knowledge and skills

- (a) acquire a fundamental understanding of cryptocurrency and e-payment – the basic principles as well as the technical and business aspects;
- (b) evaluate cryptocurrency and e-payment systems, applications and protocols; and
- (c) design and implement cryptocurrency and e-payment systems/applications.

### Attributes for all-roundedness

- (d) follow trends of e-payment and crypto-currency; and
- (e) build up on team work, presentation and technical writing skills.

## Alignment of Intended Programme Learning Outcomes:

Programme Outcome 1: This subject contributes to having students practice their writing skills with report writing.

Programme Outcome 4: This subject contributes to developing student critical thinking through written assignments and a project.

Programme Outcome 5: This subject contributes to problem solving with programming skills through lab exercises and a project.
Programme Outcome 7: This subject contributes to team work with a project for students to work in a team.

Programme Outcome 8: This subject contributes to the understanding of FinTech through assignments and a project.

<table>
<thead>
<tr>
<th>Subject Synopsis/Indicative Syllabus</th>
<th>Topic</th>
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<tbody>
<tr>
<td>1. <strong>Introduction</strong></td>
<td>Payment fundamentals; Different types of payment; Regulatory issues.</td>
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<tr>
<td>2. <strong>Security Fundamentals</strong></td>
<td>Symmetric key encryption (DES/AES encryption), Public key encryption (RSA encryption); Hash function (MD5 and SHA); Digital signature; Authentication protocols; Digital certificate; Internet security.</td>
</tr>
<tr>
<td>3. <strong>Internet Payment Systems</strong></td>
<td>SET and 3D credit card payment protocols; Electronic check; E-cash; Internet payment services.</td>
</tr>
<tr>
<td>4. <strong>Mobile Payment Systems</strong></td>
<td>Smart card payment; Apple Wallet; Google Wallet; Other mobile payment systems.</td>
</tr>
<tr>
<td>5. <strong>Cryptocurrency</strong></td>
<td>Block chain; Bitcoin; Litecoin; Other crypto-currency systems.</td>
</tr>
<tr>
<td>6. <strong>Related Topics</strong></td>
<td>Legal issues; Advanced/emerging technologies; Case studies.</td>
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</table>

**Laboratory Experiments:**
Laboratory exercises on block chain, cryptocurrency and e-payment.

**Case Studies:**
Case studies on block chain, Bitcoin, Internet/mobile payment systems.

**Teaching/Learning Methodology**
Teaching is mainly conducted through lectures. Learning is supplemented by exercises in labs/tutorials. Students are assessed through assignments, a project, a mid-term test and an examination.
Continuous assessments consist of assignments, a project and a mid-term test, which are designed to facilitate students to achieve the intended learning outcomes. The project is used to assess all learning outcomes. It is designed to enhance students’ ability to a deeper understanding of a problem of a larger scope and solving it systematically. Examination will provide a summative evaluation of the overall ability and understanding of the subject (i.e., e-payment and cryptocurrency).

Class contact:
- Class activities (lecture, tutorial, laboratory, etc.) 39 Hrs.

Other student study effort:
- Self-study and other related work 66 Hrs.

Total student study effort 105 Hrs.

Reference Books:


7. Henry Chan, Raymond Lee, Tharam Dillon and Elizabeth Chang, *E-Commerce:
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