**ASSIGNMENT BRIEF** **- The Internet of Things**

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| **Module Code** | COM6005M | **Module Tutor** | | Ahmed Abubahia | | |
| **Module Title** | The Internet of Things | | | | | |
| **Level** | 6 | **Credit Value of Module** | | 20 | | |
| **Assessment Task** | Design, develop, evaluate, and communicate the Internet of Things project that solves a problem. | | | | | |
| **Word Count** | 2000 words | | | | | |
| **Assessment No** | 1 | **of** | 1 | | **Weighting** | 100% |
| **Type of Submission** | Portfolio | | | | | |
| **Method of Submission** | Moodle  1. Project demonstration  2. Project report (to be submitted to the Moodle) + link to source code  repository (e.g GitHub). | | | | | |
| **Publication Date** | 24th October 2023 | | | | | |
| **Due Date** | 16th January 2024 | | | | | |
| **Expected Feedback Date** | 6th February 2024  ***This will normally be 15 working days from the date of submission (excludes weekends and University closure days), or 20 working days for dissertations*** | | | | | |
| **Learning Outcomes** | | | | | | |
| * LO 1. Demonstrate and effectively communicate a systematic understanding of the conceptual principles underpinning Internet of Things discourse * LO 2. Conceptualize an Internet of Things project with a critical evaluation of diligence to legal and ethical concerns * LO 3. Design, develop, deploy and evaluate an Internet of Things system * LO 4. Effectively communicate the conceptual and practical working processes and underpinning theories of the project using appropriate media. | | | | | | |

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| **Assignment Description** |
| You are to design, develop, evaluate, and communicate the Internet of Things project that solves a problem of your choice. How you approach the project is up to you, but you are strongly encouraged to develop an artifact that works and demonstrates how it solves the identified problem. This assessment is not only an opportunity for you to explore real-world multifaceted design IoT challenges but doubles as an opportunity to engage with and contribute to solving a real-life problem using Information Technology. Therefore, you should create a project that addresses a specific problem.  Your report should address the legal, ethical, commercial, and economic context of the developed project, as well as the artifact's sustainability, equality, diversity, and inclusion (EDI) issues.  To achieve this, you are to complete the following three tasks:   1. Develop an IoT artefact [ Marks 50%] - the IoT artefact must:    * Work    * Solve a problem of your choice (big or small)    * Utilise some aspect of machine two machine connectivity (e.g, LoRa, LoRa/ LoRaWAN, ZigBee, 6LoWPAN, Sigfox, GSM, RFiD, Bluetooth, NFC, etc)    * Use internet connectivity    * Use data storage and data analytics using any IoT platform (e.g., a cloud services of your choice or you may choose to develop your databases and Web server).   2. Written Report [50%]  Your report will be graded on how well you do the following.   * The structure of the report should be in logical order and format. You may adopt or modify the structure like the one below   + - Introduction and problem definition     - Project requirements’ lists and their brief descriptions (hardware, software, and cloud services, etc)     - Circuit (s) design (using simulator)     - Project testing phase     - Data analytics. You are expected to demonstrate an element of data analysis, data visualization and presentation in the project     - Legal and ethical evaluation of the technology     - Conclusion     - Source code must be submitted to GitLab Server/GitHub     - Reference     - Appendix (include the projects’ photos). * Address the legal, ethical, commercial, and economic context of the developed project, as well as the artifact's sustainability, equality, diversity, and inclusion (EDI) issues. * Communicate technical data, conceptual and practical working processes and underpinning theories of the project including project design, project development processes, project testing and project implementation. * Clear design, pictures, diagrams, and the artefacts’ schema. * Demonstrate elements of research and knowledge contributions in the project through exploring/discussing relevant works and references.   3. Project Presentation   * You are obligated to demonstrate your project for assessment in either of the following methods:   + - In-Person Presentation: If you choose to demonstrate your project in person, you may need to bring your project to the class for a maximum of 15 minutes presentation. Timetable for the presentation will be released a week prior to the demonstration week. * Video recording   + - You may choose to record or upload your project demonstration on any accessible platform (e.g., Youtube, ThingSpeak IoT platform, etc) and include the link/source to the video clip in the project report. You also have the option of submitting your recorded video demonstration to the Moodle up to a maximum of 400MB. In the event where your project presentation is not clear or not accessible, you may be advised to present the project in person before it can be accessed.   See samples of video presentations by previous students  <https://youtu.be/jwf2BNl4Gq0>  <https://www.youtube.com/watch?v=uHWDWB0eHPE&feature=youtu.be>  <https://www.youtube.com/watch?v=EYm_FhCNYpo&feature=youtu.be> |
| **Additional Information** |
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| **Assessment Regulations** |
| * Your attention is drawn to the University policy on cheating and plagiarism. Penalties will be applied where a student is found guilty of academic misconduct, including termination of programme ([Policy link](https://www.yorksj.ac.uk/media/content-assets/document-directory/documents/Academic-Misconduct-policy.pdf)). * You are required to keep to the word limit set for an assessment and to note that you may be subject to penalty if you exceed that limit. ([Policy link](https://www.yorksj.ac.uk/registry/regulations/attendance-deadlines-and-assessment/)). You are required to provide an accurate word count on the cover sheet for each piece of work you submit. * For late or non-submission of work by the published deadline or an approved extended deadline, a mark of 0NS will be recorded. Where a re-assessment opportunity exists, a student will normally be permitted only one attempt to be re-assessed for a capped mark. ([Policy link](https://www.yorksj.ac.uk/media/content-assets/registry/sort-into-subfolders/Attendance_deadlines_and_assessment.pdf)). * An extension to the published deadline may be granted to an individual student if they meet the eligibility criteria of the [Exceptional Circumstances policy](https://www.yorksj.ac.uk/ssr/policies-and-regulations-/exceptional-circumstances/).   Marking Criteria   |  |  |  |  |  |  |  |  |  |  |  |  | | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | |  | **S/N** | **Criteria for the Artefact** |  | **1st** |  | **2.1** |  | **2.2** |  | **3rd** |  | |  |  |  |  |  |  |  |  |  |  |  |  | |  | 1a | **Problem solved** |  |  |  | Problem solved with |  | Problem solved with |  | Problem solved with |  | |  |  | **accurately, and the** |  | Problem solved |  |  | high degree of |  |  | |  |  |  |  | very high degree of |  |  | degree of competence |  | |  |  | **artefact works** |  | with exceptional |  |  | competence and |  |  | |  |  |  |  | competence and |  |  | and confidence in the |  | |  |  |  |  | practical skills |  |  | confidence in the |  |  | |  |  |  |  |  | demonstrate practical |  |  | demonstration of |  | |  |  | **Total Marks** |  | beyond the level |  |  | demonstration of |  |  | |  |  |  |  | skills relevant to the |  |  | practical and |  | |  |  | **[20 marks]** |  | of study, and the |  |  | practical and |  |  | |  |  |  |  | level of study and the |  |  | professional skills |  | |  |  |  |  | artefact works |  |  | professional skills |  |  | |  |  |  |  |  | artefact works very |  |  | relevant to the level |  | |  |  |  |  | excellently. |  |  | relevant to the level |  |  | |  |  |  |  |  | well. |  |  | study. |  | |  |  |  |  |  |  |  | study. |  |  | |  |  |  |  |  |  |  |  |  |  |  | |  | 1b | **Project Originality** |  | Exceptional |  |  |  |  |  |  |  | |  |  | **(Evidence of significant** |  | originality of the |  |  |  |  |  |  |  | |  |  | **contribution)** |  | project, and |  | Very good originality of |  | Strong examples(s) of |  |  |  | |  |  |  |  | independence |  | the project, and |  | originality of thought |  | Sound evidence of |  | |  |  | **Total Marks** |  | thought and |  | independence thought |  | and solution, |  | originality of thought |  | |  |  | **[10 marks]** |  | solutions beyond |  | with a very good |  | evidence of wide- |  | and solution and clear |  | |  |  |  |  | the level of the |  | contribution to |  | ranging independent |  | evidence of study |  | |  |  |  |  | study, with |  | knowledge |  | study. |  |  |  | |  |  |  |  | exceptional |  |  |  |  |  |  |  | |  |  |  |  | clarity. |  |  |  |  |  |  |  | |  | 1c | **How effectively you use** |  | Exceptional use of |  |  |  |  |  |  |  | |  |  | **internet** |  |  | Very good use of |  |  |  | Sound evidence of using |  | |  |  |  | internet |  |  | Good use of internet |  |  | |  |  | **connection/cloud** |  |  | internet |  |  | the internet |  | |  |  |  | connectivity/cloud |  |  | connectivity/cloud |  |  | |  |  | **service platform to** |  |  | connectivity/cloud |  |  | connectivity/cloud |  | |  |  |  | services to build |  |  | services to build the |  |  | |  |  | **complete the project** |  |  | services to build the |  |  | services to build the |  | |  |  |  | the project and to |  |  | project and to store, |  |  | |  |  |  |  |  | project and to store, |  |  | project and to store, |  | |  |  |  |  | store, process |  |  | process and analyses |  |  | |  |  | **Total Marks** |  |  | process and analyses |  |  | process and analyses |  | |  |  |  | and analyses the |  |  | the data. |  |  | |  |  | **[ 5 marks]** |  |  | the data. |  |  | the data. |  | |  |  |  | data. |  |  |  |  |  | |  |  |  |  |  |  |  |  |  |  |  | |  |  |  |  |  |  |  |  |  |  |  |  | |  |  | **How effectively you** |  |  |  |  |  |  |  |  |  | |  | 1d | **demonstrate the** |  | Demonstrates a |  |  |  |  |  |  |  | |  |  | **project (during project** |  |  | Demonstrates very |  | Demonstrates good |  |  |  | |  |  |  | superior and an |  |  |  | Demonstrates average |  | |  |  | **presentation/demonstra** |  |  | good ability to |  | ability to |  |  | |  |  |  | exceptional ability |  |  |  | ability to communicate |  | |  |  | **tion)** |  |  | communicate the |  | communicate the |  |  | |  |  |  | to communicate |  |  |  | the project. |  | |  |  | **Total Marks** |  |  | project. |  | project. |  |  | |  |  |  | the project. |  |  |  |  |  | |  |  |  |  |  |  |  |  |  |  |  | |  |  | **[10 marks]** |  |  |  |  |  |  |  |  | |  |  |  |  |  |  |  |  |  |  |  | |  |  |  |  |  |  |  |  |  |  |  |  | |  |  |  |  |  |  |  |  |  |  |  |  | |  |  |  |  |  |  |  |  |  |  |  |  | |

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|  | **S/N** |  | **Criteria for the report** |  | **1st** |  | **2.1** |  | 2.2 |  | 3rd |  |
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|  | 2a |  | **Structure of the report** |  | The projects’ |  |  |  |  |  |  |  |
|  |  |  | **in a logical order and** |  | structure is with |  | The projects’ structure |  | The projects’ |  | The projects’ structure |  |
|  |  |  | **format** |  | exceptional clarity |  | demonstrates very |  |  |  |
|  |  |  |  |  |  | structure |  | is difficult to follow at |  |
|  |  |  |  |  | and audience- |  | good academic |  |  |  |
|  |  |  |  |  |  |  | demonstrates |  | times because of poor |  |
|  |  |  | **Total marks** |  | engagement, and |  | conventions that are |  |  |  |
|  |  |  |  |  |  | consistent and good |  | clarity; inconsistent |  |
|  |  |  | **[ 5 marks]** |  | the structure is |  | accurate and relevant |  |  |  |
|  |  |  |  |  |  | academic |  | demonstration of |  |
|  |  |  |  |  | with exemplary |  | to the level of study or |  |  |  |
|  |  |  |  |  |  |  | conventions. |  | academic conventions. |  |
|  |  |  |  |  | academic |  | beyond. |  |  |  |
|  |  |  |  |  |  |  |  |  |  |  |
|  |  |  |  |  | conventions. |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  |  |  |  |  |  |
|  | 2b |  | **The body of the report.** |  |  |  |  |  | Fluent and coherent |  |  |  |
|  |  |  | **How effectively you** |  | Professional, and |  |  |  | communication which |  |  |  |
|  |  |  | **communicate the** |  | innovative |  | Professional and |  | demonstrates |  |  |  |
|  |  |  | **conceptual and** |  | communication, |  | technical |  | consistent and |  | Mostly coherent |  |
|  |  |  | **practical working** |  | with exceptional |  | communication, that |  | accurate academic |  |  |
|  |  |  |  |  |  |  | communication, which |  |
|  |  |  | **processes and** |  | clarity and |  | holds the attention of |  | conventions and with |  |  |
|  |  |  |  |  |  |  | demonstrates |  |
|  |  |  | **underpinning theories** |  | audience- |  | its reader/audience |  | a good discussion of a |  |  |
|  |  |  |  |  |  |  | consistent and accurate |  |
|  |  |  | **of the project including** |  | engagement. All |  | throughout and |  | wide range of |  |  |
|  |  |  |  |  |  |  | academic conventions. |  |
|  |  |  | **project design, project** |  | the project |  | demonstrates academic |  | practical working |  |  |
|  |  |  |  |  |  |  | Not some of the |  |
|  |  |  | **development processes,** |  | criteria; project |  | conventions that are |  | processes and |  |  |
|  |  |  |  |  |  |  | criteria; project design, |  |
|  |  |  | **project testing and** |  | design, project |  | very good. All the |  | underpinning theories |  |  |
|  |  |  |  |  |  |  | project development |  |
|  |  |  | **project implementation** |  | development |  | criteria; project design, |  | of the project. All the |  |  |
|  |  |  |  |  |  |  | processes, project |  |
|  |  |  |  |  | processes, project |  | project development |  | criteria; project |  |  |
|  |  |  |  |  |  |  |  | testing and project |  |
|  |  |  | **Total marks** |  | testing, and |  | processes, project |  | design, project |  |  |
|  |  |  |  |  |  |  | implementation were |  |
|  |  |  | **[20 marks]** |  | project |  | testing and project |  | development |  |  |
|  |  |  |  |  |  |  | addressed. |  |
|  |  |  |  |  | implementation |  | implementation were |  | processes, project |  |  |
|  |  |  |  |  |  |  |  |  |  |
|  |  |  |  |  | were addressed |  | addressed very good. |  | testing, and project |  |  |  |
|  |  |  |  |  | excellently. |  |  |  | implementation were |  |  |  |
|  |  |  |  |  |  |  |  |  | addressed. |  |  |  |
|  | 2c |  | **Legal, ethical commercial, and economic context of the developed project as well as artifact’s sustainability, equality and diversity (EDI)** |  | Projects’ |  |  |  |  |  |  |  |
|  |  |  |  |  | evaluation |  | Projects’ evaluations |  | Projects’ evaluation |  | Projects’ evaluation is |  |
|  |  |  |  |  | meets the |  |  |  |  |
|  |  |  |  |  | meet the criteria for |  |  |  |
|  |  |  |  |  | criteria for |  |  | is included and |  | not included or is not |  |
|  |  |  |  |  |  | ‘good’ and are |  |  |  |
|  |  |  | **[10 marks]** |  | ‘excellent’ and is |  |  | appropriate. |  | appropriate. |  |
|  |  |  |  |  | technically sound and |  |  |  |
|  |  |  |  |  | technically |  |  |  |  |  |  |
|  |  |  |  |  |  | innovative |  |  |  |  |  |
|  |  |  |  |  | sound and |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  |  |  |  |  |
|  |  |  |  |  | innovative |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  |  |  |  |  |  |
|  |  |  | **Clear design,** |  | Exceptional and |  |  |  |  |  | The project design is |  |
|  |  |  | **pictures, diagrams** |  | excellent project |  | Very good project |  | Good project design, |  |  |
|  |  |  |  |  |  |  | somewhat good, and |  |
|  |  |  | **and the artefacts’** |  | design, diagrams, |  | design, diagrams, |  | diagrams, pictures |  |  |
|  |  |  |  |  |  |  | the diagrams, pictures |  |
|  |  |  | **architecture** |  | pictures and |  | pictures and artefact |  | and artefact |  |  |
|  |  |  |  |  |  |  | and artefact |  |
|  |  |  |  |  | artefact |  | architecture. |  | architecture. |  |  |
|  |  |  |  |  |  |  |  | architecture are clear. |  |
|  |  |  | **[10 marks]** |  | architecture. |  |  |  |  |  |  |
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|  | 2d |  | **Demonstrate** |  | Demonstrate an |  |  |  |  |  |  |  |
|  |  |  | **elements of research** |  | exceptional |  | Demonstrate a very |  | Demonstrate a |  |  |  |
|  |  |  | **and knowledge** |  | level of research |  | good level of |  |  | Demonstrate an |  |
|  |  |  |  |  |  | good level of |  |  |
|  |  |  | **contributions in the** |  | (beyond the |  | research (relevant to |  |  | average level of |  |
|  |  |  |  |  |  | research with |  |  |
|  |  |  | **project through** |  | level of the |  | the level of study) |  |  | research with |  |
|  |  |  |  |  |  | references, |  |  |
|  |  |  | **exploring/discussing** |  | study) with |  | with references, |  |  | references, citations, |  |
|  |  |  |  |  |  | citations, and |  |  |
|  |  |  | **relevant works and** |  | references, |  | citations, and |  |  | and discussion of |  |
|  |  |  |  |  |  | discussion of |  |  |
|  |  |  | **references** |  | citations, and |  | discussion of relevant |  |  | relevant works in the |  |
|  |  |  |  |  |  | relevant works in |  |  |
|  |  |  | **Total marks** |  | discussion of |  | works in the |  |  | literature. |  |
|  |  |  |  |  |  |  |  |  |
|  |  |  |  |  |  | the literature. |  |  |
|  |  |  | **[5 marks]** |  | relevant works |  | literature. |  |  |  |  |
|  |  |  |  |  |  |  |  |  |  |
|  |  |  |  |  | in the literature. |  |  |  |  |  |  |  |
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| **Summary Feedback** | | | | |
| * Address the legal, ethical, commercial, and economic context of the developed project, as well as the artifact's sustainability, equality, diversity, and inclusion (EDI) issues. | | | | |
| **First Marker:** |  | | **Date:** |  |
| *First marker feedback* | | | | |
|  | | | | |
| **Second Marker:** |  | | **Date**: |  |
| *Second marker feedback (if applicable)* | | | | |
|  | | **Provisional mark:** |  | |

|  | **PASS GRADES** | | | | | | **FAIL GRADES** | |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| (100-85) | | (84 - 70) | (69 - 60) | (59 - 50) | (49 - 40) | (39 - 20) | (19 - 0) |
| **SUMMARY DESCRIPTOR:** Learning accredited at **Level 6 (UG)** will reflect the ability tocritically review, consolidate and extend a systematic and coherent body of knowledge, utilising specialised skills across an area of study. | | | | | | | | |
|  | | **General Characteristics (UG)** | | | | | | |
| **Knowledge & understanding** | | Subject knowledge and conceptual understanding beyond expectation(s) of the level of study. | Subject knowledge and conceptual understanding that evidences a breadth/depth of reading/research significantly beyond set material. | Detailed subject knowledge and conceptual understanding relevant to the level of study and demonstrating development beyond set material. | Subject knowledge and conceptual understanding consistent with taught content. | Replication of taught content with limited demonstration of conceptual understanding. | Insufficient knowledge and understanding of the subject and its underlying concepts. | Little or no evidence of knowledge and understanding of the subject and its underlying concepts. |
| PLO(s): Enter “All” or specific PLO(s).  If N/A: Delete row | |
| **Originality** | | Originality of thought, and/or independence beyond the expectation(s) of the level of study. | Strong and sustained originality of thought and/or evidence of significant independent study. | Strong examples(s) of originality of thought and/or evidence of wide-ranging independent study. | Sound evidence of originality of thought and/or clear evidence of study independent of set/ recommended material. | Limited evidence of originality of thought and/or study independent of set/recommended material. | Very limited originality of thought and/or evidence of study independent of set/recommended material. | No originality of thought and/or evidence of independent study. |
| PLO(s): | |
| **Higher cognitive skills** | | Critical analysis/ evaluation /synthesis and/ or problem solving skills beyond expectation(s) of the level of study. | Sustained and coherent critical analysis/ evaluation/ synthesis and/or problem solving, demonstrating very high skill(s) relevant to the level of study and beyond. | Evidence of high level critical analysis/ evaluation/ synthesis and/or problem solving skills relevant to the level of study. | Sound critique, synthesis and/or problem solving skills relevant to the level of study. | Limited analysis, evaluation or critique and/or problem-solving relevant to the level of study. | Very limited analysis, evaluation critique and/or problem solving skills, evidenced through work that is mostly descriptive. | Little or no evidence of relevant analysis, evaluation, critique and/or problem-solving. |
| PLO(s): | |
| **Use of subject-specific methods/ techniques** | | Exceptional demonstration of subject-specific methods/ techniques beyond expectation(s) of the level of study. | Sophisticated demonstration of subject-specific methods/ techniques relevant to the level of study. | Consistently skilled and accurate use of subject-specific methods/ techniques relevant to the level of study. | Skilled use of subject-specific methods/ techniques relevant to the level of study. | Adequate use of subject-specific methods/ techniques relevant to the level of study. | Inadequate use of subject-specific methods/ techniques relevant to the level of study. | Little or no use of subject-specific methods/ techniques relevant to the level of study. |
| PLO(s): | |
| **Written and/or oral communication and adherence to academic conventions** | | Professional, sophisticated/ innovative communication, with exceptional clarity and/or audience-engagement, and exemplary academic conventions. | Professional communication, that holds the attention of its reader/audience throughout, and demonstrates academic conventions that are accurate and relevant to the level of study/ beyond. | Fluent and coherent communication, which demonstrates consistent and accurate academic conventions. | Mostly fluent and coherent communication; demonstration of appropriate academic conventions, which may include some errors or inconsistencies. | Communication that is difficult to follow at times because of poor clarity/structure; inconsistent demonstration of academic conventions. | Limited clarity and/or structure in communication, and/or inadequate demonstration of academic conventions. | Highly limited clarity and/or structure in written and/or oral communication. Inadequate demonstration of academic conventions. |
| PLO(s): | |
| **Practical and/or professional skills** | | Exceptional and insightful demonstration/ application of practical and/or professional skills relevant and level of study. | Very high degree of competence and confidence in the demonstration/ application of practical and/or professional skills relevant to the level of study. | High degree of competence and confidence in the demonstration/ application of practical and/or professional skills relevant to the level study. | Competent in the demonstration/ application of practical and/or professional skills relevant to the level, with evidence of developing confidence. | Competent demonstration/ application of practical and/or professional skills relevant to the level of study. | Development required in order to demonstrate competence in practical and/or professional skills relevant to the level of study. | Significant development required in order to demonstrate competence in practical and/or professional skills relevant to the level of study. |
| PLO(s): | |
| **Team work**  *as a leader or team member* | | Exceptional contribution in support of successful team outcome(s), and an insightful and critical appreciation of individual and/ or collaborative performance. | Contribution to teamwork that significantly influenced successful team outcome(s) and a critical appreciation of individual and/or collaborative performance. | Strong and sustained contribution in support of successful team outcome(s) and a comprehensive appreciation of individual and/or collaborative performance. | Professional contribution to successful team outcome(s) and a developing appreciation of individual and/or collaborative performance. | Adequate contribution to successful team outcome(s), and an appreciation of individual and/or collaborative performance that may be limited or partial and/or overly subjective. | Limited contribution to successful team outcome(s), and an appreciation of individual and/or collaborative performance that is inadequately evidenced. | Negligible (or no) contribution to successful team outcome(s). |
| PLO(s): | |