STELLENBOSCH UNIVERSITY
FACULTY OF ENGINEERING
STUDY GUIDE

1. MODULE DATA

MODULE CODE	MODULE	CALENDAR YEAR	SAQA CREDITS	WORKLOAD h/week	LANGUAGE OPTION
46795448	PROJECT (E) 448	2012	45	35 hrs/week	E or A

PROGRAMME YEAR/SEMESTER	LECTURING LOAD	HOME DEPARTEMENT
4 1 or 2	20 *p, 0t, 0s*	Electrical and Electronic Engineering

LECTURER(S)	OFFICE NUMBER(S)	TELEPHONE NUMBER(S)
Mr. J. Treurnicht (Module Coordinator)	E418	808 4409 (W)
Dr. HJ Beukes	E118	808 2290 (W)
Dr. MM Blanckenberg	E407	808 4339 (W)
Prof. DB Davidson	E413	808 4458 (W)
Prof. JB de Swardt	E415	808 4325 (W)
Dr. DIL de Villiers	E412	808 4011 (W)
Prof. JA du Preez	E307	808 4244 (W)
Dr. HA Engelbrecht	E304	808 2139 (W)
Mr. JAA Engelbrecht	E302	808 4334 (W)
Prof. CJ Fourie	E416	808 4029 (W)
Dr. RH Geschke	E414	808 4452 (W)
Dr. N Gule	E316A	808 4335 (W)
Prof. T Jones	E406	808 4319 (W)
Prof. MJ Kamper	E311	808 4323 (W)
Prof. P Meyer	E403	808 4322 (W)
Prof. HdT Mouton	E308	808 4780 (W)
Prof. KD Palmer	E417	808 4453 (W)
Prof. WJ Perold	E313	808 4368 (W)
Dr. P-J Randewijk	E408	808 4318 (W)
Prof. HC Reader	E425	808 3623 (W)
Mr. W Smit	E402	808 2120 (W)
Prof. WH Steyn	E305	808 4926 (W)
Mr. JM Strauss	E419	808 4119 (W)
Prof. G-J van Rooyen	E315	808 3805 (W)
Prof. HJ Vermeulen	E319	808 4326 (W)
Dr. R Wang	E306	808 4335 (W)
Dr. CE van Daalen	E316B	0823276309 (C)
Prof. MM Botha	E314	808 4318 (W)
Mr. A Barnard	E312	808 4006 (W)

<table>
<tr><td rowspan="2">CLASSIFICATION OF KNOWLEDGE AREAS</td><td>Mathematics</td><td>Basic Science</td><td>Engineering Science</td><td>Design & Synthesis</td><td>Computing & IT</td><td>Complementary Studies</td></tr>
<tr><td>0%</td><td>0%</td><td>0%</td><td>85%</td><td>0%</td><td>15%</td></tr>
<tr><td rowspan="2">ECSA EXIT LEVEL OUTCOMES (marked with x only if the module has ECSA exit level outcomes)</td><td>Problem solving</td><td>Application of scientific and engineering knowledge</td><td>Engineering design and synthesis</td><td>Investigations, experiments and data analysis</td><td>Engineering methods, skills, tools and IT</td><td>Professional & technical communication</td><td>Impact of engineer-ing activity</td><td>Individual, team and multidisciplinary work</td><td>Independent learning ability</td><td>Engineering Professiona-lism</td></tr>
<tr><td>X</td><td>X</td><td>X</td><td>X</td><td>X</td><td>X</td><td></td><td></td><td>X</td><td></td></tr>
<tr><td>PREREQUISITE MODULES</td><td colspan="2">PREREQUISITE PASS (P ≥ 50)</td><td colspan="3">PREREQUISITE (40≤P<50 or K ≥ 40)
Final year admission
Departmental approval</td><td colspan="5">COREQUISITE
Entrepreneurship (Eng) 444</td></tr>
<tr><td>ASSESSMENT DETAILS
See Year Book Parts 1 and 11for regulations.</td><td colspan="2">METHOD
(Examination/Flexible/Continuous/Project)
Project</td><td colspan="3">CLASS MARK CALCULATION</td><td colspan="5">FINAL MARK FORMULA
Project
Mark awarded after evaluation of project report.
A student has to <u>also</u> meet the specified outcomes of the module in the relevant assessments/questions in order for a final mark of 50 or above to be awarded. A numerically calculated mark of 50 or above does not necessarily mean a pass.</td></tr>
</table>

Approved by:

Department Manager

Chairperson/Programme Co-ordinator

2. SPECIFIC OUTCOMES AND ASSESSMENT CRITERIA

2.1. ECSA Exit Level Outcomes Assessed in this Module		
Outcome	**How is Exit Level Outcome Assessed?** It is required that the student gives an explicit indication in his/her report of how he has complied with this outcome. Both the internal and external examiners must indicate explicitly on the evaluation forms that the candidate has complied with the required outcome. If the candidate has not achieved the outcome, he/she cannot pass. The assessment method is a written report and an oral presentation. The examiners will be present at the oral and will ask pertinent questions.	**What is satisfactory performance?** Using the knowledge gained in this module, a student can do the following at the level of a graduate engineer
1. Problem solving*:* Demonstrate competence to identify, assess, formulate and solve *convergent* and *divergent* engineering problems creatively and innovatively.	In the report and/or presentation, the candidate applies a systematic problem solving method including: 1. Analyses and defines the problem, identifies the criteria for an acceptable solution; 2. Identifies necessary information and applicable engineering and other knowledge and skills; 3. Generates and formulates possible approaches to solution of problem; 4. Models and analyses possible solution(s); 5. Evaluates possible solutions and selects best solution; 6. Formulates and presents the solution in an appropriate form.	Clearly describe the problem in engineering terms and propose a solution framework for solving the problem.

2. Application of scientific and engineering knowledge*:* Demonstrate competence to apply knowledge of mathematics, basic science and engineering sciences from first principles to solve engineering problems.	In the report and/or presentation, the candidate: 1. Brings mathematical, numerical analysis and statistical knowledge and methods to bear on engineering problems by using an appropriate mix of: a) Formal analysis and modelling of engineering components, systems or processes; b) Communicating concepts, ideas and theories with the aid of mathematics; c) Reasoning about and conceptualising engineering components, systems or processes using mathematical concepts; d) Dealing with uncertainty and risk through the use of probability and statistics. 2. Uses physical laws and knowledge of the physical world as a foundation for the engineering sciences and the solution of engineering problems by an appropriate mix of: a) Formal analysis and modelling of engineering components, systems or processes using principles and knowledge of the basic sciences; b) Reasoning about and conceptualising engineering problems, components, systems or processes using principles of the basic sciences. 3. Uses the techniques, principles and laws of engineering science at a fundamental level and in at least one specialist area to: a) Identify and solve open-ended engineering problems; b) Identify and pursue engineering applications; c) Work across engineering disciplinary boundaries through cross disciplinary literacy and shared fundamental knowledge.	Apply scientific, mathematical and engineering knowledge and techniques to solve the main technical problems in the project.

3. Engineering Design*:* Demonstrate competence to perform creative, *procedural* and *non-procedural* design and synthesis of components, systems, engineering works, products or processes.	In the report and/or presentation, the candidate executes an acceptable design process encompassing the following: 1. Identifies and formulates the design problem to satisfy user needs, applicable standards, codes of practice and legislation; 2. Plans and manages the design process: focuses on important issues, recognises and deals with constraints; 3. Acquires and evaluates the requisite knowledge, information and resources: applies correct principles, evaluates and uses design tools; 4. Performs design tasks including analysis, quantitative modelling and optimisation; 5. Evaluates alternatives and preferred solution: exercises judgment, tests implement ability and performs techno-economic analyses; 6. Assesses impacts and benefits of the design: social, legal, health, safety, and environmental; 7. Communicates the design logic and information.	Provide details of the main design procedures and processes followed including results obtained from using these processes.
4. Investigations, experiments and data analysis*:* Demonstrate competence to design and conduct investigations and experiments.	The candidate executes an acceptable process including but not restricted to: 1. Plans and conducts investigations and experiments; 2. Conducts a literature search and critically evaluates material; 3. Performs necessary analyses; 4. Selects and uses appropriate equipment or software; 5. Analyses, interprets and derives information from data; 6. Draws conclusions based on evidence; 7. Communicates the purpose, process and outcomes in a technical report.	Demonstrate the capability to investigate and conduct experiments and obtain engineering data from these measurements as inputs to the design or to evaluate the design.
5. Engineering methods, skills and tools, including Information Technology*:* Demonstrate competence to use appropriate engineering methods, *skills* and tools, including those based on information technology.	The candidate: 1. Uses method, skill or tool effectively by: a) Selecting and assessing the applicability and limitations of the method, skill or tool; b) Properly applying the method, skill or tool; c) Critically testing and assessing the end-results produced by the method, skill or tool. 2. Creates computer applications as required by the discipline.	Use analysis methods and design procedures based on tools mastered during the 3rd and 4th year in the project to support the analysis and design process.

6: Professional and technical communication*:* Demonstrate competence to communicate effectively, both orally and in writing, with engineering audiences and the community at large.	The candidate executes effective written communication as evidenced by: 1. Uses appropriate structure, style and language for purpose and audience; 2. Uses effective graphical support; 3. Applies methods of providing information for use by others involved in engineering activity; 4. Meets the requirements of the target audience. The candidate executes effective oral communication as evidenced by: 1. Uses appropriate structure, style and language; 2. Uses appropriate visual materials; 3. Delivers fluently; 4. Meets the requirements of the intended audience.	The student must demonstrate that he/she can generate a professional project report and can defend the quality of his/her work during an oral examination. This process includes short oral presentation by the candidate.
7. Impact of Engineering activity*:* Demonstrate *critical awareness* of the impact of engineering activity on the social, industrial and physical environment.	Not assessed here.	
8. Individual, team and multi-disciplinary working*:* Demonstrate competence to work effectively as an individual, in teams and in multi-disciplinary environments	Not assessed here.	
9. Independent learning ability*:* Demonstrate competence to engage in independent learning through well-developed learning skills.	The candidate shows evidence of being an effective independent learner by the following: 1. Reflects on own learning and determines learning requirements and strategies; 2. Sources and evaluates information; 3. Accesses, comprehends and applies knowledge acquired outside formal instruction; 4. Critically challenges assumptions and embraces new thinking.	The student must demonstrate that he/she can understand the complexities of the problem, source, evaluate, comprehend and apply suitable knowledge to solve the problem within the time and budget constraints
10. Engineering Professionalism*:* Demonstrate *critical awareness* of the need to act professionally and ethically and to exercise judgment and take responsibility within own limits of competence.	Not assessed here.	

3. LECTURER/STUDENT AGREEMENT AND RESPONSIBILITIES

The candidate makes an appointment with the project leader within one class week after the announcement of the project allocations. At this meeting the aims, requirements and planning of the project are discussed. The final project proposal is summarised in the form of an agreement (Appendix A) between the project leader and the candidate, where the expectations and responsibilities of both parties are clearly stated. The agreement must be completed by the end of the first week of the semester, with a copy to the Project Coordinator. This copy is filed by the Project Coordinator. The project leader and the candidates also agree on the time for the weekly appointments.

The **project leader** must give guidance to the candidate by:

- Making the candidate aware of the departmental policy with regard to the course module;
- Honouring the weekly appointments with the candidate;
- Verifying on a continuous basis that the candidate has clarity with regard to the aims of the project, and that the planning of the project is a true reflection of the aims;
- Monitoring the progress of the project, and encouraging the student to have a critical approach to the problem;
- Explanation of new concepts to the candidate;
- Spelling out the consequences of blatant plagiarism;
- Explanation of the importance of effective communication;
- Emphasising the importance of verification that all the outcomes, as listed in Appendix C, were satisfied.

During the execution of the project the **candidate** must:

- Adhere to the policy with regard to the course module, and ensure that all due dates are honoured.
- Attend the weekly appointments with the project leader;
- Use a work book with numbered pages to record all project work, with appropriate dates. The work book must be signed by the project leader on a weekly basis, and must be available during the oral examination to determine the extent of the project;
- With the exception of field measurements and report writing, work in the buildings of the Faculty;
- Verify that all the outcomes of the project, as listed in the evaluation form (Appendix C), were satisfied;
- Compile a planning schedule (Appendix A in project report) for the project. The candidate must present the planning schedule during an oral presentation that will be scheduled during the second week of the semester;
- Compile a specification (Appendix B in project report) for the project.

4. EVALUATION

The final mark is determined by evaluation of the following:

- Project report
- Oral evaluation
- Poster presentation

The internal examiners determine whether all the claimed outcomes, as well as the complementary study aims, were achieved. The external examiner is responsible for the final mark. He/she has access to the evaluation reports of the internal examiners, as well as the project reports. In the case of any queries, he/she is also free to question the students during the poster session. The final mark is verified by the external examiner by his/her signature. That is the final certification that all the claimed outcomes, as well as the complementary study aims, were achieved.

All marks are verified by the Departmental Executive.

A candidates who wants to query the final result, must submit a written appeal to the Departmental Chair within 14 days after the marks were officially announced. The written statement must include a motivation for the disagreement, as well as all other relevant information. The Departmental Chair will refer the appeal to the Departmental Executive for a final decision.

5. PROJECT REPORT

Every candidate must submit **two complete copies** of the project report (bound) by the due date and -time at the secretary in room E309, as well as an electronic copy on WebCT, which will be used to prevent plagiarism, using Turnitin.

The required report format is as follows:

- Typed on A4 paper, with the body of the report not longer than 40 pages.
- Bound with thin carton cover pages (all copies).
- All tables. graphs, diagrams and photos must be numbered and have captions.
- Margins: left 3 cm, right 2 cm, top and bottom 2,5 cm.
- 12 point font with 1 or 1½ line spacing.

The required report sections are:

- **Title page**, with the following:
  - Name of project.

- Name of candidate.
- The words "Report submitted in partial fulfilment of the requirements of the module Project (E) 448 for the degree Baccalaureus in Engineering in the Department of Electrical and Electronic Engineering at the University of Stellenbosch".
- STUDY LEADER: (Name of lecturer(s)); DATE: (Month and Year).
- Page with acknowledgements.
- A declaration of own work as follows:

  "I, the undersigned, hereby declare that the work contained in this report is my own original work unless indicated otherwise.

  Signature Date".

- Page with **summaries** in Afrikaans and English, each about 150 words.
- **Table of Contents.**
- **Lists** with figures, tables and symbols.
- Chapter1: **Introduction**, where the background to the project and the project aims are described. Previous work done on a similar topic, with the methods that were used, are also described. A short summary of the report can also be given.
- Chapters 2..n-1: **Body** of the report, and results.
- Chapter n: **Conclusions** and recommendations.
- **Literature references** using IEEE format.
- **Appendix A**: Project planning schedule.
- **Appendix B**: Project specification.
- **Appendix C**: Outcomes compliance.
- **Appendices**, that may include circuit diagrams, measured data, derivations, programs, printouts, etc.

6. ORAL EVALUATION

The oral examination is used in conjunction with the main report to determine the extent to which the candidate was able to satisfy the outcomes of the module. The evaluation form is given in Appendix C.

The Project Coordinator appoints two examiners, consisting of the project leader and another lecturer, as well as a convenor for the oral. The Project Coordinator gives a copy of the main report to each of the examiners.

The format for the oral examination is as follows:

- The evaluation is chaired by the convenor of the oral.
- The preliminary reports from the two main examiners, with a preliminary mark allocation, are handed to the presiding convenor. The evaluations are based on the evaluation form and ensure

that all the required outcomes, and complementary study goals, were considered in awarding the preliminary mark.

- The candidate hands over his work book to the presiding convenor.
- The candidate has 10 minutes for his oral presentation. The use of transparencies/overhead projector is advised.
- The examiners can ask questions to determine the extent to which the candidate has mastered the work.
- The study leader gives an indication of the extent of the guidance that was required by the candidate.
- The mark is finalised after discussion. The following recommendations are possible (subject to the verification of the external examiner):
  - The candidate passes with PP≥50%. The candidate may be required to make editorial changes to the report before the mark is finalised.
  - The candidate fails with PP=45, but is granted an opportunity to make improvements on the same topic. Such a candidate will only graduate in April.
  - The candidate fails with PP≤40%. The course module must be repeated with a different topic.
  - In the case where the examiners cannot reach consensus, the project is referred to the Departmental Executive for a decision.
- In order to assist the external examiners, summarising commentary from examiners and the convenor during the oral, on the evaluation form is encouraged.
- The two preliminary evaluation forms, with the preliminary marks, and one copy of the project report is handed to the Project Coordinator.

7. EXTERNAL EXAMINATION

The external examiners visit the department after completion of the internal evaluation process. The Project Open Day is scheduled to coincide with their visit. Every candidate must prepare a poster that is presented at the Project Open Day. The poster (A1 size) must give an overview of the scope of the project, as well as the main results. The candidate must also prepare a short oral presentation (3 minutes maximum) to give the external examiners an overview of the project.

The external examiner decides upon a final mark and verifies that all the claimed outcomes, as well as the complementary study aims, were achieved. The final mark is verified by the signature of the external examiner. The evaluation form for the external examiners is shown in Appendix D.

The final verification of the claimed outcomes and the complementary study aims cannot take place in the absence of the candidates, and **attendance of the Project Open Day is therefore compulsory.**

8. IMPORTANT DATES

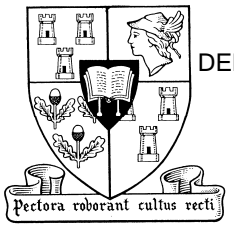
The Project Coordinator asks for project topics from lecturers within the first two weeks of the second term. The topics are allocated to students, and verified by the Departmental Executive.

Students are required to make an appointment with their project leaders before the start of the vacation in order to be able to make preliminary preparations during the vacation period.

The following dates are very important:

Semester 1	Semester 2	Activity
25 Jan 2012	19 July 2012	Official commencement of project.
21 May 2012 (14H00)	29 October 2012 (12H00)	Due date for the handing in of project reports (E413 at 12:00). Penalty for late submission is 5% per ½ day.
24 May 2012	1 Nov 2012	Commencement of oral evaluations.
TBA	20 Nov 2012	Project Open Day

APPENDIX A



UNIVERSITY OF STELLENBOSCH

DEPARTMENT OF ELECTRICAL AND ELECTRONIC ENGINEERING

AGREEMENT BETWEEN STUDENT AND STUDY LEADER RE MUTUAL RESPONSIBILITIES – PROJECT (E) 488

Student:

Study leader:

Project:

1. It is the responsibility of the student to clarify aspects such as the definition and scope of the project, the place of study, research methodology, reporting opportunities and -methods (i.e. progress reports, internal presentations and conferences) with the study leader.
   Aims:

   _____

   _____

   _____

   _____

   _____

   (Use other side of paper if necessary)
2. It is the responsibility of the study leader to give regular guidance and feedback with regard to the literature, methodology and progress.
3. The rules re. the handing in and evaluation of the project is outlined in the Study Guide and will be strictly adhered to.
4. The project leader conveyed the departmental view on plagiarism to the student, and the student acknowledges the seriousness of such an offence.

Study leader: Student:

Date:

APPENDIX B

INTERNAL EXAMINATION – PROJECT (E) 448

CONVENER'S EVALUATION FORM

Candidate	
Project title	
Date & time	

Comments:

Recommended mark: (Based on discussion after both forms are handed to convenor)

Study leader (first internal examiner):

Name	Signature

Second internal examiner:

Name	Signature

Convener:

Name	Signature

Attach marking sheets of the two examiners to this sheet for external examination.

APPENDIX C
EVALUATION FORM FOR INTERNAL EXAMINATION - PROJECT (E) 448

Candidate's name	
Project title	

Examiner's name (print)	**Examiner's signature**	**Supervisor/internal (indicate)**
		[ ] Supervisor [ ] Internal examiner

Comments:

_____

_____

_____

_____

_____

_____

(Each examiner completes independently an evaluation from. Both forms plus the Convenor form are handed to the Module Coordinator.)

Preliminary Mark

Outcome	**Assessment Items**	**Tick** ✓ / ✖
1. Problem Solving (identify, assess, formulate and solve convergent and divergent engineering problems).	• Identify problem + solution criteria; • Identify engineering info required for solution; • Formulate solution approaches; • Model/ analyze solutions; • Evaluate solutions; • Formulate / present the solution.	**[ ]**
2. Application of Scientific and Engineering Knowledge	• Use Engineering knowledge and methods o Formal analysis and modeling; o Communicate concepts, ideas and theories; o Reasoning and conceptualizing using components; o Dealing with uncertainty. • Use Physical laws as foundation o Formal analysis and modeling; o Reasoning and conceptualizing using physical principles. • Use techniques, principles and laws of engineering science o Identify and solve open-ended engineering problems; o Work across engineering disciplinary boundaries (shared fundamental knowledge).	**[ ]**

3. Engineering Design (procedural and non-procedural design and synthesis of components, works, products and processes)	• Identify/formulate problem to satisfy user needs, applicable standards, code of practice and legislation; • Plans and manages the design process; • Acquires and evaluates requisite knowledge; • Performs design tasks, quantitative modeling and optimization; • Evaluate alternatives (judgment, implement ability and techno economic analysis); • Assesses impact and benefits; • Communicates design logic and information.	**[ ]**
4. Investigations, experiments and data analysis (design and conduct investigations and experiments)	• Plan and conduct investigations/ data analysis; • Conducts critical literature search; • Performs analysis; • Select and use equipment/ software; • Analysis/ interprets information from data; • Draws conclusion (evidence); • Communicates purpose, process and outcomes in report.	**[ ]**
5. Engineering Methods, Skills and Tools, including Information Technology (methods, skills and tools, including those based on information technology)	• Uses method, skill and tools by: o Selecting/ assessing the applicability/ limitations of the methods, skills and tools; o Properly applying the method, skill or tool; o Critically testing and assessing the results produced. • Creates computer applications	**[ ]**
6. Professional and Technical Communication (effective oral and written communication)	• Written communication: o Uses appropriate structure, style and language for purpose/ audience; o Uses effective graphical support; o Applies engineering methods of providing information; o Meets the requirements of the intended audience. • Oral communication: o Uses appropriate structure, style and language; o Uses appropriate visual materials; o Delivers fluently; o Meets the requirements of the intended audience.	**[ ]**
9. Independent learning ability (independent learning through well-developed learning skills)	• Reflects on own learning and determines requirements and strategies; • Sources and evaluates information; • Assesses comprehends and applies knowledge acquired outside formal instruction; • Critically challenges assumptions and embraces new thinking.	**[ ]**

APPENDIX D
EVALUATION FORM FOR EXTERNAL EXAMINATION - PROJECT (E) 448

Candidate's name	
Project title	

Examiner's name (print)	**Examiner's signature**

Comments:

_____

_____

_____

_____

_____

_____

Preliminary Mark (from convenor form) [ ]

Final Mark (external) [ ]

Pass/Fail ✓ / ✖ [ ]

Outcome	**Assessment Items**	**Tick** ✓ / ✖
1. Problem Solving (identify, assess, formulate and solve convergent and divergent engineering problems).	• Identify problem + solution criteria; • Identify engineering info required for solution; • Formulate solution approaches; • Model/ analyze solutions; • Evaluate solutions; • Formulate / present the solution.	**[ ]**
2. Application of Scientific and Engineering Knowledge	• Use Engineering knowledge and methods o Formal analysis and modeling; o Communicate concepts, ideas and theories; o Reasoning and conceptualizing using components; o Dealing with uncertainty. • Use Physical laws as foundation o Formal analysis and modeling; o Reasoning and conceptualizing using physical principles. • Use techniques, principles and laws of engineering science o Identify and solve open-ended engineering problems; o Work across engineering disciplinary boundaries (shared fundamental knowledge).	**[ ]**

3. Engineering Design (procedural and non-procedural design and synthesis of components, works, products and processes)	• Identify/formulate problem to satisfy user needs, applicable standards, code of practice and legislation; • Plans and manages the design process; • Acquires and evaluates requisite knowledge; • Performs design tasks, quantitative modeling and optimization; • Evaluate alternatives (judgment, implement ability and techno economic analysis); • Assesses impact and benefits; • Communicates design logic and information.	**[ ]**
4. Investigations, experiments and data analysis (design and conduct investigations and experiments)	• Plan and conduct investigations/ data analysis; • Conducts critical literature search; • Performs analysis; • Select and use equipment/ software; • Analysis/ interprets information from data; • Draws conclusion (evidence); • Communicates purpose, process and outcomes in report.	**[ ]**
5. Engineering Methods, Skills and Tools, including Information Technology (methods, skills and tools, including those based on information technology)	• Uses method, skill and tools by: o Selecting/ assessing the applicability/ limitations of the methods, skills and tools; o Properly applying the method, skill or tool; o Critically testing and assessing the results produced. • Creates computer applications	**[ ]**
6. Professional and Technical Communication (effective oral and written communication)	• Written communication: o Uses appropriate structure, style and language for purpose/ audience; o Uses effective graphical support; o Applies engineering methods of providing information; o Meets the requirements of the intended audience. • Oral communication: o Uses appropriate structure, style and language; o Uses appropriate visual materials; o Delivers fluently; o Meets the requirements of the intended audience.	**[ ]**
9. Independent learning ability (independent learning through well-developed learning skills)	• Reflects on own learning and determines requirements and strategies; • Sources and evaluates information; • Assesses comprehends and applies knowledge acquired outside formal instruction; • Critically challenges assumptions and embraces new thinking.	**[ ]**