

GRCSE materials for BKCASE Workshop IV

Wed 13/10 1:30-3:30pm (Overview)

- Current state
 - The GRCSE document provided on 1 October 2010 is a “substantial draft” working towards version 0.25, due for release 15 December 2010.
 - This document was inspired by GSWE2009 but represents significant new work building towards a different vision for SE education
 - GRCSE in the current form providing a reference curriculum for SE-centric SE programs

Wed 13/10 1:30-3:30pm (Overview)

- Compared with GSWE2009 GRCSE has additional types of information:
 - An intended discussion of expected objectives of graduate programs
 - And intended discussion of possible assessment approaches for use in a graduate program
 - Extended discussion of Bloom's Taxonomy to include the Affective Domain
 - And intended discussion of the relationship of student learning and assessment processes

Wed 13/10 1:30-3:30pm (Overview)

- The heading level outline of the GRCSE
 - Preface
 - Acknowledgements
 - Executive summary
 - Section 1 introduction
 - Section 2 guidance instruction of the GRCSE
 - Section 3 expected objectives
 - Section 4 expected outcomes

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- Section 5 expected student background
- Section 6 curriculum architecture
- Section 7 core body of knowledge
- Section 8 assessment
- Section 9 expect the GRCSE evolution
- Appendix A summary of survey
- Appendix B Bloom's taxonomy
- Appendix C SE competency frameworks

Wed 13/10 1:30-3:30pm (Overview)

- Appendix D assessment and learning outcomes
- References
- Glossary
- Index

Wed 13/10 1:30-3:30pm (Overview)

- Driving perspectives (underlying assumptions)
 - There are flavours of SE which are distinguishable as technical systems development, systems management, supplier or contractor site practices, and acquisition side practices
 - All SE practitioners need a fundamental core set of knowledge and extensions depending on which flavour of SE practice they follow

Wed 13/10 1:30-3:30pm (Overview)

- Driving perspectives (underlying assumptions)
 - The reference curriculum must allow significant space for individual University tailoring to suit local contexts
 - The CorBOK will be presented as a list of topics following the same structure as SEBOK. The CorBOK will be annotated with Bloom levels of achievement for student outcomes

Wed 13/10 1:30-3:30pm (Overview)

- Reasoning – discussion intended
 - There are flavours of SE were distinguishable as technical systems development, systems management, supplier or contractor site practices, and acquisition side practices
 - The 4 groups seem to reflect four groups of SE practice
 - The 4 groups seem to focus on different knowledge
 - The 4 groups seem to emphasise different issues
 - The 4 groups each have their own career paths
 - The four groups appear to need different education

Wed 13/10 1:30-3:30pm (Overview)

- Reasoning – discussion intended
 - All SE practitioners need a fundamental core set of knowledge and extensions depending on which flavour of SE practice they follow
 - The core knowledge provides a common overview of SE for all groups of practitioners
 - The extension knowledge provides the specific knowledge required individual's specific practice
 - Different areas of practice require different levels of attainment in each knowledge area and topic

Wed 13/10 1:30-3:30pm (Overview)

- Reasoning – discussion intended
 - The reference curriculum must allow significant space for individual University tailoring to suit local contexts
 - University programs are constrained by institutional policy and regulatory environment – this impacts permissible degree structures etc
 - It is useful for universities to respond to their local environment – particularly the kinds of industry to which many students will proceed
 - This results in GRCSE being abstract, not directive

Wed 13/10 1:30-3:30pm (Overview)

- Reasoning – discussion intended
 - The CorBOK will be presented as a list of topics following the same structure as SEBOK. The CorBOK will be annotated with Bloom levels of achievement for student outcomes
 - This provides consistency between GRCSE and SEBOK
 - Bloom levels of achievement will be stated as minimum expectations for any degree, individual degrees should produce attainment at a higher level for many items
 - We need to work out how to deal with the complexity introduced by the multiple flavours

Wed 13/10 1:30-3:30pm (Overview)

- State of maturity of GRCSE sections (information)
 - Preface
 - Reasonably mature – a few points are intended for discussion later
 - Acknowledgements
 - Reasonably mature – a few points are intended for discussion later

Wed 13/10 1:30-3:30pm (Overview)

– Executive summary

- Reasonably mature – some items need to be discussed later

– Section 1 introduction

- Reasonably mature – one section will need to be rewritten to transition effectively from SW to SE

– Section 2 guidance instruction of the GRCSE

- Quite mature – the GRCSE team believe that this is a version 0.25 text. This section and there is the majority of the underlying assumptions of the GRCSE work.
- The assumptions change the text will need to change

Wed 13/10 1:30-3:30pm (Overview)

- Section 3 expected objectives
 - We have no substantive text
 - We have some discussion points for later in this meeting
- Section 4 expected outcomes
 - This section is fairly mature. Limitations concern cross linkages with other sections. (The most important of these concern the later discussion of the CorBOK and curriculum architecture.)
 - We also have some discussion planned

Wed 13/10 1:30-3:30pm (Overview)

- Section 5 expected student background
 - This section is fairly mature –we have some discussion points planned
- Section 6 curriculum architecture
 - Low maturity – we have something which expresses our current ideas. This expresses our idea of core and extension material.
 - We have discussion points planned
- Section 7 core body of knowledge
 - Very immature – plan significant discussion

Wed 13/10 1:30-3:30pm (Overview)

- Section 8 assessment
 - Very immature – all we have is a paragraph expressing our intended purpose
 - We plan discussion
- Section 9 expect the GRCSE evolution
 - Reasonably mature – this is acceptable text or version 0.25 subject to our understanding of the intentions the correct
- Appendix A summary of survey
 - Fairly mature – we have discussion points planned

Wed 13/10 1:30-3:30pm (Overview)

- Appendix B Bloom’s taxonomy
 - Reasonably mature – we have discussion points planned
- Appendix C SE competency frameworks
 - Reasonably mature – we have discussion points planned
- Appendix D assessment and learning outcomes
 - No text written – we have a brief outline the intended content
 - We plan discussion

Wed 13/10 1:30-3:30pm (Overview)

– References

- Is automatically generated. No discussion required

– Glossary

- We have identified a number of terms and acronyms used to date.
- If you have been completed, much further work is required
- We have discussion points planned

– Index

- This will be automatically generated

Wed 13/10 3:50-6:15pm (Draft)

- Preface (discussion points)
 - Table 1 lists the GRCSE team, table 2 lists the BKCASE team
 - Some people have contributed to both. Should people who have contributed to both be listed in both places?
 - Alternative: GRCSE contributors listed in table 1 only and other BKCASE in table 2 only
 - All BKCASE authors are listed because of the dependence of GRCSE on the SEBOK of BKCASE

Wed 13/10 3:50-6:15pm (Draft)

- Preface (discussion points)
 - Subject to the conclusion of the previous discussion point:
 - There are two comments in the bullet point section. Is the text in those bullet points clear in conveying the intent indicated in those comments?
 - Is the preface content correct in fact?
 - Is the preface content, order and style appropriate?

Wed 13/10 3:50-6:15pm (Draft)

- Acknowledgements (discussion points)
 - We have noted comments about points which must be maintained going forward.
 - Is the content of this section appropriate?

Wed 13/10 3:50-6:15pm (Draft)

- Executive Summary (discussion points)
 - The executive summary is quite long by the standards of executive summaries
 - Does the first page appear consistent with the rest of the document?
 - Is it appropriate to bring forward all the numbered item key points from the later chapters which address specific subject areas?

Wed 13/10 3:50-6:15pm (Draft)

- Executive Summary (discussion points)
 - Do we need a section at the end of the executive summary with the heading “discussion”?
 - What content should appear under “discussion”?

Wed 13/10 3:50-6:15pm (Draft)

- Introduction (discussion points)
 - On the second page of this section there is a large section which has been commented upon. This section needs to be modified to reflect SE rather than SW. The current text has been carried over from GSWE2009.
 - Action: GRCSE team to modify to reflect SE
 - Is the content of the introduction appropriate?

Wed 13/10 3:50-6:15pm (Draft)

- Guidance (discussion points)
 - The GRCSE team believe this section text is mature
 - The numbered items embed the GRCSE team assumptions and foundational perspectives
 - Reasoning is provided in Section 2

Wed 13/10 3:50-6:15pm (Draft)

- Guidance (discussion points)
 - Do the guidelines pitch GRCSE at the right level in the spectrum of prescription/abstraction and flexibility?
 - Is there any significant change recommended/suggested?
 - Please provide recommended text changes or questions about wording in writing to Tim Ferris

Wed 13/10 3:50-6:15pm (Draft)

- Objectives 3-5 years out (discussion points)
 - This section is intended to discuss the career direction of graduates
 - Achievement of the objectives is not solely dependent on an education program
 - Achievement of objectives is related to development of competencies which are desired by employers
 - Education programs must be designed to create the foundations from which an individual can (with experience and additional training) grow into an advancing career

Wed 13/10 3:50-6:15pm (Draft)

- Objectives 3-5 years out (discussion points)
 - This section is intended to provide:
 - Perspective for program developers concerning the post-graduation career growth which the program should enable
 - Establish the concept that graduate programs in SE are the beginning of a career
 - Views of the BKCASE author team are sought

Wed 13/10 3:50-6:15pm (Draft)

- Outcomes (discussion points)
 - This section is fairly mature
 - The description is general and cross references later discussions, particularly CorBOK and the curriculum architecture
 - Is the discussion at the right level of abstraction to be useful to program developers in the context of the GRCSE document?

Wed 13/10 3:50-6:15pm (Draft)

- Expected Background (discussion points)
 - This section is fairly mature
 - Have we provided a reasonable set of entrants expectations?
 - Is our expectation of background bachelor level study appropriate?
 - Is numbered points 2 a reasonable expectation or does it unnecessarily exclude appropriate applicants?
 - Should the paragraph after numbered point 3, concerning University policy issues, be a plain paragraph or be upgraded as a numbered point?

Thurs 14/10 9:00-12:30pm (Draft)

- Curriculum Architecture (discussion points)
 - The text here captures our principal ideas but is not presented as mature text
 - Our reasoning follows that some SE knowledge fundamental and every systems engineer to know it
 - This knowledge is classified as “core foundation topics”
 - We build on our assumption of the validity of “flavours” of SE
 - Flavours are supported by “core extension topics”

Thurs 14/10 9:00-12:30pm (Draft)

- Curriculum Architecture (discussion points)
 - We provide “the main/program specific specialty/ elective topics” as our placeholder for university specificity
 - We believe that some kind of “capstone experience” should be included in a program
 - We describe various ideas of what could constitute a suitable capstone experience. These ideas provide a diversity of capstone experiences which would result in potentially different capabilities being developed

Thurs 14/10 9:00-12:30pm (Draft)

- Curriculum Architecture (discussion points)
 - Figure 1 describes the overall curriculum architecture
 - We want to reduce to a single figure, either 1a or 1B, which form of the curriculum architecture figure is clearer in expressing our concept
 - 1A seems to suggest a hierarchical increase of level through the program
 - 1B seems to suggest a floundered expansionary growth of the student through a program
 - Figure 2 shows the relation of courses and architecture
 - We want to use the same figure form for both 1 and 2

Thurs 14/10 9:00-12:30pm (Draft)

- Curriculum Architecture (discussion points)
 - Figures 3, 4 and 5 show three flavour type use of SE: a product view, an enterprise view and a service view
 - A question has arisen as to whether these three use our best presented here, in the middle of the curriculum architecture, or someone else
 - We seek views on this question

Thurs 14/10 9:00-12:30pm (Draft)

- Curriculum Architecture (discussion points)
 - Figure 6 attempts to show a time and depth of learning relationship which would be experienced by a student during the program
 - Should this figure then modified in order to make the message clearer? (We have had some uncertainty in relation to this)

Thurs 14/10 9:00-12:30pm (Draft)

- CorBOK (discussion points)
 - This section is very immature. We have expressed our current ideas
 - We intend to structure the CorBOK according to the structure of SEBOK
 - This consistency will assist readers with cross referencing issues

Thurs 14/10 9:00-12:30pm (Draft)

- CorBOK (discussion points)
 - We intend to provide Bloom level of achievement indications for each sub topic that we include in the cognitive domain
 - We intend to provide gloom levels of achievement indications for the affective domain for either the top-level knowledge areas or for selected topics or subtopics
 - The effective practice of SE depends on the individual valuing and being characterised by their valuation of certain knowledge areas

Thurs 14/10 9:00-12:30pm (Draft)

- CorBOK (discussion points)
 - We will do this for the core knowledge required of all systems engineers
 - We will also do this for be extended for knowledge required for the particular “flavours” that we pursue
 - Are we going the right way?

Thurs 14/10 9:00-12:30pm (Draft)

- Assessment (discussion points)
 - This section is intended to provide some indications of potential means of assessing students
 - The purpose of this section is to provide suggestions which can be considered by program developers for their appropriateness in the specific circumstances of their program
 - We expect that this will be a fairly short section (2 or 3 pages)

Thurs 14/10 9:00-12:30pm (Draft)

- Assessment (discussion points)
 - This section would be based on a general discussion of the relationship of student learning and modes of assessment provided in appendix D
 - Does the author Tim see that you in providing this kind of information?

Thurs 14/10 9:00-12:30pm (Draft)

- Evolution of GRCSE (discussion points)
 - We see the text of this section as mature subject to the arrangements for ongoing support of GRCSE through INCOSE and IEEE

Thurs 14/10 9:00-12:30pm (Draft)

- Appendix A survey (discussion points)
 - This appendix describes the survey of existing Masters programs which we conducted at the beginning of the GRCSE project
 - The current form includes our findings related to:
 - Program attributes
 - Program focus
 - Admission requirements
 - Language requirements
 - Work experience

Thurs 14/10 9:00-12:30pm (Draft)

- Appendix A survey (discussion points)
 - The findings are summarised in a set of numbered points
 - We intend to write a section concerning comparison of institutions based on purpose
 - We intend to write a section concerning a gap analysis between GRCSE and the current programs

Thurs 14/10 9:00-12:30pm (Draft)

- Appendix A survey (discussion points)
 - Is the information provided in the findings useful to our audience?
 - Should we maintain our table in which we name fusions who have responded?
 - Is this index clear?

Thurs 14/10 9:00-12:30pm (Draft)

- Appendix B Bloom's taxonomy (discussion points)
 - This appendix describes Bloom's taxonomy of educational outcomes. We include:
 - Cognitive domain – obvious application
 - Affective domain – we believe there is a need for systems engineers to value and be characterised by the evaluation of systemic approaches to engineering
 - Psycho motor domain – this is included for completeness but is unlikely to be used. A un-used we will delete

Thurs 14/10 9:00-12:30pm (Draft)

- Appendix B Bloom's (discussion points)
 - Is this section clear to a non-educator?

Thurs 14/10 9:00-12:30pm (Draft)

- Appendix C competencies (discussion points)
 - This section describes a number of SE competency frameworks
 - The intention is that these competency frameworks will inform the selection of knowledge areas and topics for CorBOK
 - Does this content belong here? (We note that there is a chapter of SEBOK which addresses the same topic area)

Thurs 14/10 9:00-12:30pm (Draft)

- Appendix D assessment (discussion points)
 - This has not been written yet
 - Our intention is to describe the relationship of assessment and student learning in general
 - It is commonly observed that students learn according to the assessment rather than according to the stated course objectives
 - The purpose of this appendix is to provide background referencing the education literature to support section 8

Thurs 14/10 9:00-12:30pm (Draft)

- Glossary and terms (discussion points)
 - We have collected a number of glossary and terms items
 - Some are standard SE vocabulary which will be included in SEBOK
 - We propose to copy SEBOK definitions where available
 - Some are specific to GRCSE
 - We propose to find or create definition text

Thurs 14/10 1:30-2:30pm (Way ahead)

- GRCSE ver 0.25 review release is scheduled 15 December 2010
- Ready the final editing version 0.25 scheduled 15 November 2010

Thurs 14/10 1:30-2:30pm (Way ahead)

- GRCSE team must:
 - Complete copyright release forms
 - Respond to BKCASE author team review comments
 - Write objective section
 - Improve expression of the curriculum architecture
 - Produce a first version of a populated CorBOK
 - Write assessment section
 - Write appendix D