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**Government Notice (No. 180 of 2015): Draft Curriculum Statements for the National Senior Certificate for Adults, Government Gazette No. 38520, 6 March 2015**

The above-mentioned subject has reference.

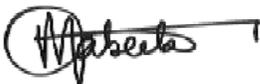
Kindly find attached hereto HESA's comments on *Draft Curriculum Statements for the National Senior Certificate for Adults*.

The details of the contact person submitting the commentary document on behalf of HESA are:

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I trust that the DHET will find these comments of value and look forward to hearing from you should you need further engagements on the matter.

Regards



**DR JEFFREY MABELEBELE**  
**CHIEF EXECUTIVE OFFICER**

## **COMMENTS ON THE DRAFT CURRICULUM STATEMENTS FOR THE NATIONAL SENIOR CERTIFICATE FOR ADULTS**

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### **1 BACKGROUND**

HESA was invited to comment on the NASCA draft curriculum statements of Mathematical Sciences; Mathematical Literacy; Languages; Natural Science; Social Science; ICT and Economic and Management Sciences

The request for comment was circulated to all Public Universities for evaluation by relevant subject specialists. For the purpose of this report the general feedback will be dealt with first followed by detailed comment for each subject in which comments were received.

### **2 COMMENTS PER SUBJECT AREA**

#### **A Mathematical Sciences (Mathematics and Mathematical Literacy)**

##### **General comment**

The Mathematics can be helpful for those who want to use the NASCA route to gain entry into University whilst Mathematical Literacy is appropriate for immediate needs of adult learners to address day to day problems.

The key to any mathematics syllabus is to give a variety of experiences to students in employing their skills. They should not simply learn standard form procedures. This does not develop mathematical thought or the use of mathematical language. Students should be able to apply their algebraic skills to solving equations even when the equations appear in a completely unfamiliar form with unfamiliar variables.

##### **Detailed comment**

The Mathematics/Mathematics Literacy curriculum are similar to the NSC curriculum in certain aspects, however, there are some important omissions:

1. Differential calculus: The NSC allocates three weeks to teaching differential calculus in grade 12, from limits through to simple optimisation problems. This material is worth 35 marks in paper 1 (roughly 25% of the paper). The omission of differential calculus not necessarily seen as problematic but it does indicate that the NASCA curriculum has been pitched at a slightly lower level than the NSC.
2. Probability: The NSC allocates 6 weeks across grades 10, 11 and 12 to this material, from Venn diagrams through to the fundamental counting principle. This material is worth 15 marks in paper 1 (roughly 10% of the paper). The omission of probability

should not cause any trouble for first-year students in their mathematics courses. We are worried by the omission of similarity. It seems to be one of the few places in the NSC curriculum where students are asked to think slightly abstractly.

3. Euclidean geometry, specifically similarity: The documents seen are not sufficiently granular to establish exactly how much time is devoted to this material, nor how it will be assessed.
4. A significant missing element of this syllabus is the absence of any mention of so-called “word problems”. This does not mean standardised problems with a standard algorithmic solution that can be learnt by heart. Rather students should learn to express a variety of different verbal descriptions of relationships in the language of mathematical symbols. Students should learn to respond to the wording of the descriptions to create equations expressing the relationship described rather than trying to recognise the “trigger” phrase that indicates a standard expression needs to be used. This is seen as essential to acquiring real mathematical skill as opposed to just learning standard procedures off by heart. The absence and the lack of any reference to this skill is concerning.
5. Logarithms must not be neglected. It is not enough to simply evaluate logs using a calculator. Logarithmic relationships have an extensive application at University level and should be explored thoroughly. The relationships in logarithmic identities must be used in a variety of ways to solve equations. Due emphasis needs to be put into seeing a logarithm as the power or exponent that it represents. Hence the logarithms of the values of an exponential function follow a linear pattern etc.
6. The Data handling topic and learning outcomes are not aligned with the practice of data handling. There is no mention of the need to demonstrate knowledge of how to gather data responsibly in order to investigate a problem, or how to use calculated statistics to interpret data in context. The narrow references to calculation of statistics do not hold any promise for meaningful learning and teaching of the vital skill of data handling.
7. Other omissions have been indicated in *italics* below.

#### 7.1. Algebraic manipulation

Solving simultaneous equations: liner, quadratic, exponential and logarithmic.

- By substitution
- *By elimination (Not in this syllabus?)*

#### 7.2. *Solving equations with algebraic fractions. (Not in this syllabus?)*

#### 7.3. Series and applications - examining:

- *The linearity of the arithmetic series. (Not explicitly in this syllabus?)*
- *The exponential nature of the geometric series. (Not explicitly in this syllabus?)*

#### 7.4. Functions

- Composite function - recognising functions and notation. *(Not explicitly in this syllabus?)*
- *Transformation (Not explicitly in this syllabus?)*
- *Application (modelling) (Not explicitly in this syllabus?)*

## Conclusion

The ideal NASCA student who understands all the material in the curriculum at high-level would probably cope with first-year mathematics however, the proposed NASCA assessment structure does not seem to incentivise students to obtain high-level understanding, or would be able to differentiate between this ideal student and another who is merely competent. Students passing with the same grade as is expected from NSC candidates (this may vary from institution to institution) should manage studying Mathematics at university level, **provided** they are taught a preparatory 2/3 weeks of the topics mentioned above, and are prepared to put in some extra work at first year level, or go in to first year Computation Mathematics.

Anyone hoping to enter the sciences at tertiary level will require the Trigonometry and students wishing to study BEconSci would be affected by this. An introductory knowledge of statistics is important as a first year course in Business Statistics.

## Errors

The following errors have been identified and should be corrected

1. Page 3 the curriculum states “Bivariate data: Variance and standard deviation of” , and ... “Best fit function; Regression lines”.
2. Page 6: “Understand and demonstrate the use of variance and standard deviations as measures of dispersion of a set of bivariate data”
3. Page 25: “Calculate Variance and Standard deviation manually for small sets of data only”  
Bivariate data show covariance, not variance. The standard deviation of bivariate data is a misnomer. Best fit function seems to refer to the shape of a scatterplot only, since there is no indication that more is required than an intuitive map between shape and algebraic functions. I support emphasis on understanding the shape of scatterplots and how shape influences the accuracy of the statistical measures we use (like correlation and regression), but then be specific.

There is no benefit in drawing in a linear estimate of best fit if the use of the (least squares) regression line is available. Certainly drawing such an estimate line is not a level 4 outcome. Reference to the plural “regression lines” is also problematic. Is the intention really that more than one type of regression is required? Regression lines are not used to predict outcomes of problems without a clear indication of the trust in the prediction. Regression lines provide gradients that are used to analyse the rate of covariation, expected covariation between different states. This is nowhere evident in the outcomes, yet much is made of parameters of functions in that content area.

## B Languages (English as a First Additional Language)

### General Comment

This is a very important subject which can be used to encourage resuscitation of the IKS and how they can be used to revive values for respect of human life and others. The languages curriculum appears to treat a broad variety of communication forms and to include both every day and literary sources. Students focusing on more than just the written language is welcomed, although this is of great importance in higher education.

It is recommended that sources used in the curriculum range from those that employ straight forward everyday language to those that include more academic texts. (Students battle to read academic texts with understanding and this should be supported at senior certificate level where possible. Language for learning is different to that required for communication and both need attention. Students also battle with information literacy in terms of being able to judge the validity and authority differences in the wide variety of information available to them. We believe that this should also be deeply engaged with within the study of language.)

### **Detailed Comment**

1. In general, the curriculum centres around 5 themes, namely, Language and personal development; Language and working life; Language and the world around you; Language for learning and Language and literature. However, it is clear from the elaboration that these are not themes, but different types of literacy and levels of proficiency. The emphasis is on being able to analyse and produce particular text-types which have particular purposes, audiences and typical ways of using language.
2. The curriculum appears to be trying to achieve two distinct goals (a) equipping students with the proficiency required to engage in English for specific everyday/workplace contexts; and (b) equipping students with the academic literacy skills required to use the language across the curriculum.
3. While these goals are not necessarily incommensurate, there is little evidence of an understanding of how they will be achieved other than mention of the recursive nature of language learning and the need for skills integration. In addition, the assessment guideline indicates that assessment will be focussed on English for everyday/workplace contexts rather than academic literacy.
4. The following are specific points which elaborate on the above:
  - 4.1. The curriculum places emphasis on functional, situation-specific workplace literacy, everyday communication. This emphasis is evident in 'themes' 1-3 and in the assessment. While the curriculum stresses the importance of listening and speaking, it is not envisaged that these skills will be tested and in some 'distance' education contexts, this will not be feasible.
  - 4.2. Rather than understanding language as a tool for learning (as is evident in the CAPS curriculum), the NASCA curriculum makes the false assumption that language for learning is a separate, generic skill which can be taught in 'theme 4'. It also makes the mistaken assumption that 'theme' 4 can equip learners with the cognitive academic language proficiency that they need to use their second language in their other subjects and that this theme will equip students for further education. It recommends teaching advanced research skills and describes the importance of understanding the language of disciplinary discourses. However, it is not at all clear how such language learning could be accomplished in the general terms described in the curriculum. Moreover, this form of literacy appears not to be assessed at all.
  - 4.3. The fifth 'theme', Language and Literature is fairly cognitively demanding and is similar in content to the FAL curriculum, but smaller in scope.
  - 4.4. The NASCA curriculum is fairly silent on language teaching approaches. It mentions the importance of critical language awareness and the importance of a process approach to

writing but does not elaborate. The process writing approach contradicts the emphasis on genre and the production of specific text types for particular contexts.

4.5. There seems to be no notion of assessment for learning and the final assessment outlined in the document is far less than that required in CAPS FAL grade 12.

4.6. The document is vague in many parts and there are many grammatical errors.

## **C Natural sciences**

### **General Comment**

These subjects are reminiscent of High School. A fundamental question is: do they really address the learning needs of adult learners?

Chemistry:

### **Detailed Comment**

1. Perhaps the most fundamental difference between the two curricula is the overall design. The NSC curriculum for chemistry is divided into three components namely Matter and Materials (46%), Chemical Systems (13%) and Chemical Change (46%) while the NASCA curriculum gives equal weighting to Matter and Chemical Change.

2. The NSC component, Chemical Systems, covers the following topics:

- Hydrosphere
- Lithosphere (mining; energy resources)
- Chemical industry (fertilizer industry).

These topics allow the teacher the opportunity to provide a context for the concepts covered in Matter and Materials and Chemical Change. Since this component is absent from the NASCA curriculum, the students are likely to experience the concepts in the curriculum as very traditional and perhaps boring.

3. Other areas in which the NASCA curriculum is deficient are:

3.1. Optical phenomena and properties of materials (photo-electric effect, emission and absorption spectra)

3.2. Organic chemistry (functional groups; saturated and unsaturated structures; isomers; naming and formulae; physical properties; chemical reactions (substitution, addition and elimination).

3.3. Organic macromolecules (plastics and polymers)

3.4. Electrochemical reactions (electrolytic and galvanic cells; relation of current and potential to rate and equilibrium; standard electrode potentials; oxidation and reduction half reaction and cell reactions; oxidation numbers; application of redox reactions).

4. Research has shown that organic chemistry and electrochemical reactions are challenging topics for first year chemistry students who have completed their studies according to the NSC curriculum.

5. The NASCA curriculum refers to practical activities are being an important component of which could be incorporated into the learning experiences yet there are no details of what types of activities might be suitable in this context.

## **Conclusion**

The learning outcomes for most sections in the proposed NASCA curriculum place considerable emphasis on the ability to state concepts which is not likely to promote a high level of conceptual understanding. This type of approach encourages rote learning which would place students at a disadvantage for tertiary studies.

As it stands, the NASCA curriculum is not equivalent to the current NSC curriculum. Thus it would not be a suitable qualification for entry into tertiary studies for students intending to major in chemistry or any other subject which requires a first year chemistry course as a pre-requisite.

## **Biology**

1. Evaluators expressed concern that there is no basic 'cellular biology' included in this curriculum. It would strengthen the curricula if there were aspects of cell structure and function, and some basic cellular processes included (i.e. respiration, metabolism, and photosynthesis). It is essential that learners first understand the common aspects of life and life processes before trying to explain the diversity of life. It is not the diversity that drives life processes, but the other way round.
2. The point of departure of this document, viz. "Evolution is the core principle in Biology that explains the diversity we see around us" is a bit controversial. It can be argued that it is the reactions of living organisms to environmental and genetic pressures that drives changes that can explain some of the diversity we see around us. Evolution is therefore the product and not the explanation of diversity. It is therefore very important to understand how living organisms function, what their genetic makeup is and how the environment and changes in the environment affects it. Ecology is therefore also central to understanding diversity and of much more socio-economic importance to building an understanding of Biology and its relevance to our society than understanding the theory of evolution. When learners understand the basics they can operate much more efficiently in science and society

## **D Social sciences**

### **Geography**

#### **Detailed Comment**

1. The NASCA curriculum aligns well with the NSC knowledge and skills required however it does not cover the following aspects that are addressed in the NSC namely the practical component of Cartography and Map work (not just the analysis and interpretation, but the actual map making process), weathering, plate tectonics, volcanism and earthquakes as part of the geomorphology section. The human geography section covers ethnic geography, cultural geography, demographics, biogeography with Developmental issues
2. A mild concern was expressed that the secondary focus on human geography runs counter to the positioning of this in the Social Sciences (rather than the Physical Sciences)

3. The time to marks ratio for both papers is indicated as 2 hours (120 minutes) / 150 marks. Maybe 150 minutes / 150 marks should be more appropriate to allow students to exhibit the expected cognitive skill levels.

## **Errors**

The following errors in the Technical layout and editing were identified will need attention:

1. Inconsistent use of capital letters and small caps in paragraph headings (e.g. par.1.2 WEATHER AND CLIMATIC EXPLANATIONS, but par. 2.1 Rock types. Also, 3.1 RURAL SETTLEMENT vs. 3.2 Urban settlement.) There are numerous such examples in the whole document.
2. Numbering and spacing is not consistent e.g. sometimes there are spaces after a paragraph number, other times not. E.g. 1.GEOMORPHOLOGY.

## **History**

### **General Comment**

The curriculum looks very interesting and covers some of the important themes in history that South African students should know more about. One area of concern is that the curriculum seemingly turns a blind eye to the importance of African History. Current experiences of Xenophobia point to the lack of understanding of the important historical, political and economic changes which have shaped Africa to be what it is now. The content of this subject perpetuates mental colonisation of the African child. A big part of what is missing; are the Lifaqane wars which have had a big impact in relation to what Africa is today. This could replace or follow the cold war in Europe section. African has a rich History.

### **Detailed Comment**

1. The Exit Level Outcomes are vague, and not obviously related to the subject matter being taught. The notion of 'values' associated with the Social Sciences is puzzling and no attempt is apparent in the document to articulate what these values might be. Likewise, while fostering 'empathy, fairness and tolerance' is an unquestionably desirable outcome, these approaches do not self-evidently demonstrate how this might be achieved.
2. Following from this, it is notable that the methods described for History are also far less specific than those described for Geography. This is related to the absence of a discussion of the nature of the 'sources' to be examined - are these envisaged as primary sources, witness testimonies, or statistical data? This matters because the choice of sources relates directly to the social Outcomes apparently desired.
3. The choice of the Cold War and Civil Resistance in South Africa for 'Source-Based' questions isn't clearly explained. It is difficult to understand how these topics are particularly suited to source-analysis, while the Independent Africa and Coming of Democracy themes are suitable for Essay Questions. The distinction isn't clearly grounded and runs the risk of counteracting the potential Outcomes by splitting source-focussed work from analytical work in History (whereas the work of Social Sciences must, of course, be in the interconnections of sources and analysis).

4. The following comments relate mostly to some of the definitions of history, and what the study of history involves.

#### 4.1. What is history?

In the line 'History is the study of change *and development* in society over time' leave out 'development'. History is not about the study of development over time, as that implies that development progresses with time. Some historians find the idea of 'development' problematic, so rather leave out.

Also leave out 'how *past human action* has an impact on...' and replace with 'how the past has an impact on the present'. Human action is not the only factor that influences history, for example environmental factors also shape history.

#### 4.2. Specific Aims of History

Under the fourth bullet point, '*an understanding of historical concepts*' could perhaps rather be 'an understanding of *historical methodology*, including the use of historical sources and evidence'. Delete 'future' from that sentence. Perhaps also add in 'think analytically *and critically* about the stories people tell us about the past...'

#### 4.3. Content Structure

It would be helpful to provide the dates or periods of each theme. For example will the Cold War period studied be from 1917 or 1945 (or any other number of dates that are often given as 'the start' of the Cold War). Also, it may be worth simply referring to 'The Cold War' rather than 'The Cold War in Europe', as the Cold War incorporated many parts of the world – the USA is one obviously important player in the Cold War. Similarly, what period of independence and post-independence will the curriculum focus on?

#### 4.4. Subject Content, Theme 2:

- Under 'Political' and 'types of leaders' perhaps just write 'important leaders'.
- It is suggested that the question 'what are the qualities of a good leader?' be left out – for history students the issue of leadership should not simply be about what qualities makes a good or bad leader. There are many factors that influence the impact that a leader has, and the decisions they make. More important when studying leaders is to try and understand the style of their leadership, their personality (without providing a judgement about whether the qualities they had were good leadership qualities) what influenced them, what their ideologies were, how and why they became leaders and gained a following, what impacted on the decisions that they made and the outcome of those decisions.
- Under 'economic' – the term 'third world countries' is problematic, rather refer to 'developing countries'.

## Errors

There are a number of grammatical problems. In general, the document could benefit from proofreading. For example:

1. Under 3.3 bullet point 2: 'Construct Explanation' should be 'Construct Explanations'
2. Under 3.6, all of the themes need proofreading.
3. Under 3.6, Theme 2, 'The successes and challenges faced by independent Africa?' should be 'What were the successes and challenges faced by independent Africa?'

4. The amount of detail provided under each theme is uneven.

## **E Information and Communication Technology**

### **General Comment**

The inclusion of this subject is welcomed as many faculties at many universities are looking for computer literacy for all students. The use of the 2 stages is valuable as many students do not have prior exposure to mainstream computer packages such as MA Word, MS Excel etc.

### **Detailed Comment**

1. In terms of catering for diverse technologies needed by persons with disabilities. A section on assistive devices would make the submission inclusive and improve its social impact.
2. Evaluators were of the opinion that students do not necessarily need exposure to many of the underlying hardware/technology concepts as most would never have occasion to apply these. Rather the emphasis should be on educating students as informed users who are able to use and make decisions around appropriate use of technology to support business and daily life. Exposure to use of technology as an enabler and supporter of business operations is valuable to both potential commerce students as well as across most disciplines in most faculties.
3. It would be useful for students to apply simple business applications in MS Excel, write reports etc. in MS Word, and use MS PowerPoint for presentations. Links to doing assignments for their other subjects could be provided.
4. The recommendation would be to provide for depth in focused areas around problem solving and technology based solutions (looking at what rather than how), and remove aspects like hardware etc. which in today's world of technology users are far removed from.
5. Outcomes focused on describing, explaining and listing features or concepts should be balanced with simple application questions that can be constructed around scenarios. Practical exercises should also be emphasized to ensure that learners understand what they are doing rather than using strictly procedural knowledge

## **F Economics and management sciences**

### **General Comment**

This is an extremely important area whereby given the problem of unemployment ravaging the world now, understanding the economy becomes crucial. One would think that highlighting and emphasizing entrepreneurship for employment creation would have far reaching effects than countries sitting with young people who hope for employment that is not there. Highlighting the impact of disability to the economy and the loss of not involving disabled persons in productive activities is imperative.

It would be good for students to have some, albeit elementary, exposure to heterodox theoretical views on economics: the Austrian school, Marxist economics, feminist economics, etc. as context for considering the South African situation.

We suspect that one of the reasons for high failure rates in economics at universities is that students are suddenly exposed to a lot of mathematical tools of analysis in economics. Some introduction to these tools in the school syllabus would therefore be advisable

### **Detailed Comment**

1. Evaluators were of the opinion that the time allocation for 100 marks is adequate. If 40% is expected on the middle level of Bloom and 30% on the higher level, the time duration should be at least 2 hours (120 minutes) for 100 marks to allow students to exhibit these higher cognitive abilities adequately
2. The choice of modules and themes presents adult learners with a potential interest in pursuing further studies in the fields of commerce and management with introductory exposure to many of the disciplines. This is valuable and will help to ensure that these learners are making informed choices in this regard and might also assist in determining some level of aptitude.
3. "Module 4 Money matters" should also include the following:
  - 3.1. Financial literacy – very important
  - 3.2. Risk and return (different ways of calculating return)
  - 3.3. Introduction to financial markets and instruments (this is mentioned briefly, but it is not complete and only a few aspects are mentioned) – there are many instruments that are applicable to the average person which is not purely investment related)
  - 3.4. Time value of money (discounting and yielding is very important, however understanding time value of money as a whole is critical).
4. "Module 5 Contemporary Economic issues" should include reference to the importance of sustainability on economic and financial and environmental levels.
5. A specific overall concern lies with a potential mismatch between overall stated Exit Outcomes which imply higher levels of required engagement by learners than the detailed learning outcomes. The overall exit outcomes suggest that students will be able to apply the knowledge and skills gained in solving problems relating to the economic sciences which we support. However, the detailed outcomes presented by module, have a strong bias towards List, Describe, Explain, Distinguish between, etc. The outcomes need to be adjusted to support both application and problem solving in line with the assessment levels described.
6. Assessment objectives look to be fair and does relate to NQF level 4 and assessment opportunity looks to be balanced in terms of Sections A - C and what is expected in each section. Blooms's taxonomy is used in a suitable way to get to the "educational levels".
7. Exit level outcomes should also refer broadly to the "Business operations" and the "Money matters" modules. It seems to be focusing only on "Economics".

### **3 CONCLUSION**

HESA hopes that the Department will take into account the comments above in finalizing the curriculum for NASCA. The suggested improvements will go a long way in addressing the glaring deficiencies identified in the curricula of various subjects. In this regard, we are more than willing to engage you further on the issues raised in the submission.

**END**

***Submitted: 14 May 2015***