The International Olympiad in Informatics Syllabus –
changelog 2013

This document contains a short list of all the changes between this version of the Syllabus and the version used in 2012.

- The description of two categories in Section 3 has been modified.
  The Syllabus now specifies a more exact boundary between topics that are guaranteed not to be used at an IOI and topics that may be used, but for which no prior knowledge is expected or necessary.

- In §4.1:
  Real numbers are reclassified as Out of focus.
  Basic modular arithmetics is ▼ (but modular inverses are Explicitly excluded).
  “Pythagorean theorem” is corrected to ⊖.

- In §4.2 DS3:
  “The structure of formal proofs” and “Well orderings” are now omitted as being too vague.

- In §4.2 DS4:
  “Pigeonhole principle” and “Inclusion-exclusion principle” are corrected to ⊖: we do not want to use them in problem statements.

- In §4.2 DS5:
  “Bipartite graphs” were promoted to △.

- In §4.2 DS6:
  The simplest applications of discrete probability are now Out of focus instead of being completely excluded.
• In §4.2 DS7:
  “Systems of linear equations” have been explicitly added as *Out of focus*; “Non-trivial operations on polynomials and matrices” were moved to *Explicitly excluded*.

• In §5.1 PF3:
  Anything related to non-trivial data structures was moved to §5.2.
  In special cases, usage of real numbers has been reclassified as *Out of focus* – for example, “computing the Euclidean distance of two points, storing it in a variable and returning it” belongs to this category. Still, all uses that require the contestants to understand the floating-point representation and/or reason about precision errors are *Explicitly excluded*.

• In §5.1 PF4:
  “Implementation of recursion” is promoted to ⊖ (as “Recursive backtracking” already was).

• In §5.1 PF5:
  Clarified that implementing reactive tasks is △.

• In §5.2 AL2:
  Even though XOR (used at IOI 2002) was a task to design approximation algorithm, within the current classification “Approximation algorithms” are now classified as *Out of focus* – along with newly added “Randomized algorithms” and promoted “Heuristics”.

• The original §5.2 AL3 “Fundamental computing algorithms” has now been split into AL3a “Algorithms” and AL3b “Data structures”.

• In §5.2 AL3a:
  QuickSort-related topics are now phrased better.
  The ambiguous “slope search” has been removed.

• In §5.2 AL3b:
  Topics related to binary search trees have been specified in more detail.
  Interval trees are now explicitly mentioned in addition to the closely-related Fenwick trees.
  Added the Union-FindSet data structure used to represent disjoint sets as ⊖.
  In previous version, hash tables were classified as Not needed in one place and Excluded in the other. With the new classification, the
proper classification is *Explicitly excluded* – the contestants are free to use them, but there will not be a task that focuses on hashing, nor a task that requires the contestants to use hashing.

- In §5.2 AL4, AL8, AL9, AL11:
  Distributed, randomized, cryptographic, and parallel algorithms are now all classified as *Out of focus*.

- In §5.2 AL10:
  “Intersection of line segments” has been clarified because it may have been misinterpreted as “Efficient computation of the intersections of $n$ line segments”, which was not intended. Some simpler algorithms have been added explicitly.

- In §5.2 AL5, AL6, AL7:
  Parts that were previously classified as Not needed are now *Out of focus*, the rest is still *Explicitly excluded*.
  The meaning of AL6 is now clarified to not exclude NP-hard problems from being used.

- In §5.3:
  Basics of computer graphics are now *Out of focus*.