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 $\ominus$ (as "Recursive backtracking" already was).

- In §5.1 PF5:
  Clarified that implementing reactive tasks is $\triangle$.

- 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 $\ominus$.
  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*.