$[STUDENT, MODULE]$

$LEVEL ::= I \mid C \mid H \mid M$

$next\_lower == \{M \mapsto H, H \mapsto C, C \mapsto I\}$

$prereq : MODULE \leftrightarrow MODULE$

$prereq^+ \cap \mathrm{id}\, MODULE = \varnothing$

$level : MODULE \to LEVEL$

$no\_mods : STUDENT \to (STUDENT \leftrightarrow MODULE) \to LEVEL \nrightarrow \mathbb{N}$

$\forall s : STUDENT;\ r : STUDENT \leftrightarrow MODULE;\ l : LEVEL \mid$

$r (\!| \{s\} |\!) \cap level^\sim (\!| \{l\} |\!) \in \mathbb{F}\, MODULE \bullet$

$no\_mods\ s\ r\ l = \#(r (\!| \{s\} |\!) \cap level^\sim (\!| \{l\} |\!))$

Enrolled

$enrolled : \mathbb{F}\, STUDENT$

$module : \mathbb{F}\, MODULE$

$registered : STUDENT \leftrightarrow MODULE$

$registered \in enrolled \leftrightarrow module$

EnrolledP

Enrolled

$passed : STUDENT \leftrightarrow MODULE$

$passed \subseteq registered$

$\forall r : registered \bullet \{first\ r\} \times prereq (\!| \{second\ r\} |\!) \subseteq passed$

Enrol

$\Delta Enrolled$

$e? : STUDENT$

$e? \notin enrolled$

$enrolled' = enrolled \cup \{e?\}$

$module' = module$

$registered' = registered$

Register

$\Delta Enrolled$

$e? : STUDENT$

$m? : MODULE$

$e? \in enrolled$

$m? \in module \setminus registered (\!| \{e?\} |\!)$

$enrolled' = enrolled$

$module' = module$

$registered' = registered \cup \{e? \mapsto m?\}$

RegisterP

$\Delta EnrolledP$
$Register$

$passed' = passed$

Deregister

$\Delta Enrolled$
$e? : STUDENT$
$m? : MODULE$

$e? \in enrolled$
$m? \in registered \, (\!|\, \{e?\} \,|\!)$
$registered' = registered \setminus \{e? \mapsto m?\}$

Transfer

$\Delta Enrolled$
$e? : STUDENT$
$from? : MODULE$
$to? : MODULE$

$e? \mapsto from? \in registered$
$to? \in module \setminus \{from?\}$
$e? \mapsto to? \notin registered$
$registered' = registered \setminus \{e? \mapsto from?\} \cup \{e? \mapsto to?\}$
$enrolled' = enrolled$
$module' = module$