**1. Purpose**

This document defines the business rules, validation logic, and workflow scenarios for the TWAAOS-SIC Exam Scheduling System, intended for precise software implementation without ambiguity.

**2. User Roles and Permissions**

**2.1 Roles**

* **SG (Group Leader):**
  + Proposes exam dates for their own group and year.
  + Cannot view or edit exams for other groups.
  + Can only import exam Excel files for their own group.
* **CD (Professor):**
  + Validates/approves/rejects exam proposals for disciplines they teach.
  + Assigns rooms and assistant professors for each exam.
  + Must ensure there are no scheduling conflicts (overlaps) for themselves, assigned rooms, and groups.
* **SEC (Secretariat):**
  + Uploads, edits, and exports templates.
  + Manually edits or finalizes schedules.
  + Notifies group leaders and professors.
  + Can import/export data for all groups/disciplines.
* **ADM (Administrator):**
  + Creates/edits users, sets metadata.
  + Full access to all system data and audit trails.
  + Cannot log in via Google OAuth2; only via password/JWT.

**3. Data Import & Validation Rules**

**3.1 Excel Import (Exams, Disciplines, GroupLeaders)**

* Only users with SG, SEC, or ADM role may import data.
* At import:
  + All referenced names (faculty, program, group, discipline, professor, assistants, room) must exist in the system.
  + The group leader may only import exams for their assigned group; all rows with other group names are rejected.
  + Disciplines must belong to the same faculty, program, and year as the importing group.
  + Exams scheduled for a discipline outside of the group’s program/year are rejected.
  + All dates must have correct format (YYYY-MM-DD HH:MM:SS).
  + Assistant names (if multiple) must be separated by ; and all must exist in the user list.

**3.2 Conflict Prevention**

* A room cannot be double-booked for overlapping times.
* A professor or assistant cannot be scheduled in two places at the same time.
* A group cannot have two exams at the same time.
* These checks apply for both import and manual scheduling.

**4. Exam Scheduling & Status Workflow**

* **Exam proposal:**
  1. SG proposes exam (manual or via Excel import).
  2. Exam enters pending status.
  3. CD (professor) reviews, can set status to approved or rejected.
  4. On approval, CD may set confirmed\_date, assign assistants/room.
  5. On final approval, status becomes approved and exam is published (publication\_date is set).
  6. If rejected, a reason is recorded, and status is rejected.
* **Status field values:**
  1. pending: Awaiting professor approval.
  2. approved: Validated and confirmed by professor.
  3. rejected: Denied by professor (must have a reason).
  4. cancelled: Cancelled after approval.
  5. completed: Exam has taken place.

**5. Notifications & Communication**

* On every important status change (pending→approved, pending→rejected, approved→cancelled), an email notification is sent:
  + To group leader (SG) and professor (CD) involved in the exam.
  + SEC may be copied on all status notifications.
* Notifications are sent asynchronously and logged in the system.

**6. Data Export**

* **SEC and ADM** can export data in Excel, PDF, and ICS (calendar) formats.
* Exports must respect user permissions:
  + SG sees only their group’s data.
  + CD sees only exams for their disciplines.
  + SEC/ADM see all data.

**7. API Access & Security**

* Google OAuth2 used for SG, SEC, CD users (with @usv.ro or @student.usv.ro domains).
* JWT authentication (username/password) required for ADM role.
* Only SEC and ADM may manage (import/export) full datasets.

**8. Error Handling**

* **On import:**
  + Each rejected row must report a specific error (ex: “Discipline ‘X’ does not exist for program ‘Y’”, “Assistant name not found”, “Room already booked at this time”).
  + No partial/invalid data is accepted.
* **On user action:**
  + All forbidden actions (ex: scheduling for another group, importing exams with wrong discipline) must trigger clear, user-facing error messages.

**9. Example Scenarios (Happy Path & Edge Cases)**

**Scenario 1: Valid Import**

* SG “Radu Popescu” for group “3A1” uploads exam list.
* All exams are for “3A1”, all disciplines and professors exist, no date conflicts.
* All rows imported, status set to pending, professors notified.

**Scenario 2: Mismatched Discipline**

* SG “Radu Popescu” tries to schedule “Electronics” (Automation) for group “3A1” (Computers).
* System rejects with: “Discipline ‘Electronics’ does not match group ‘3A1’ program.”

**Scenario 3: Room Conflict**

* SEC schedules two exams in “A101” at the same time.
* System rejects the second with: “Room ‘A101’ is already booked at [time].”

**Scenario 4: Assistant Name Error**

* Exam row lists assistant “Maria Popa” who is not in users list.
* Import is rejected for that row with: “Assistant ‘Maria Popa’ does not exist.”

**10. Audit & Traceability**

* All data imports, user actions, approvals/rejections, and exports are logged with timestamp and user.
* The system must provide an audit trail for any change.

**11. API Behavior**

* Endpoints must enforce all business rules at both input validation and business logic layers.
* API errors must return HTTP 4xx for user errors, 5xx for system errors, and descriptive error messages for each.

**12. Edge Cases**

* Exams cannot be scheduled for past dates.
* Publication date cannot be before approval date.
* If an exam is cancelled, all related notifications must be sent.

**13. Glossary**

* **SG**: Group Leader (student)
* **CD**: Professor
* **SEC**: Secretariat
* **ADM**: Administrator
* **Exam**: A scheduled test for a discipline, group, date, and room.
* **Discipline**: A subject or course taught in a given year and program.
* **Program**: Specialization (e.g., Computers, Automation)
* **Faculty**: e.g., FIESC