

# Administrator Manual - SIGIE

Comprehensive School Route Management System



# Administrator Manual - SIGIE

Comprehensive School Itinerary Management System

## 1. Introduction to Administrative Roles

### 1.1. Hierarchy and Responsibilities

#### SYSTEM ADMINISTRATOR

- Full control over all modules and users
- Monitoring system performance via Zabbix
- Global configuration and maintenance
- Data backup and recovery

#### ACADEMIC DIRECTION

- Management of the academic structure (teachers and subjects)
- Final control over schedule publication
- Supervision of the complete generation process
- Approval of academic configurations

#### ACADEMIC COORDINATION

- Execution of automatic schedule generation
- Manual editing and optimization of schedules
- Management of teacher availability
- Administration of the observation system

### 1.2. Access and Authentication

System URL: <http://192.168.2.139>

Administrative Login Process:

1.234.567-8

1. Enter ID in format
2. Enter assigned password
3. Select specific role: Administrator, Director or Coordinator
4. Click on "Login"

**Inicio de Sesión**

**C.I**

C.I

**Contraseña**

Contraseña

**Seleccione su rol:**

Seleccione un rol ▼

- Seleccione un rol
- Administrador
- Director
- Coordinador
- Docente
- Padre/Madre




## 2. Administrative Dashboard

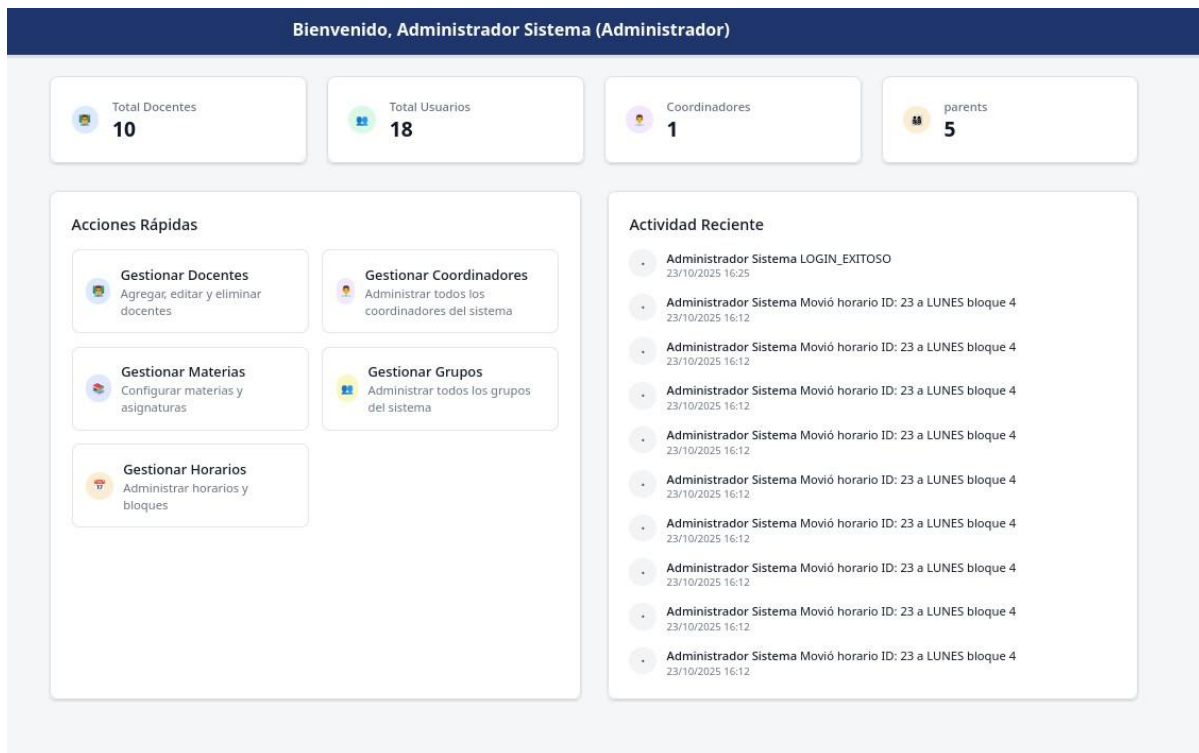
### 2.1. System Overview

Key Metrics:

- Active Users: Real-time counter
- Generated Schedules: Statistics for the current period
- Pending Conflicts: Alerts to resolve
- Teachers with Availability: Percentage completed

System Alerts:

-  Critical: Conflicts that block publication
-  Warnings: Problems that require attention
-  Informative: System updates



## 2.2.Role Navigation

Administrator Menu:

- User Management
- System Monitoring
- Global Configuration
- Complete Reports

Management Menu:

- Teacher Management
- Subject Management
- Schedule Publication
- Academic Reports

Coordinator Menu:

- Schedule Generation
- Schedule Editing
- Teacher Availability
- Predefined Observations

### 3. Role: System Administrator

#### 3.1. Complete User

Management Access:

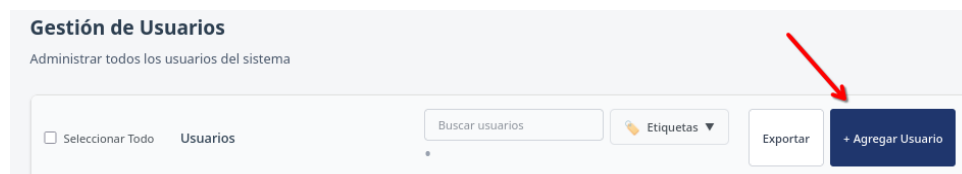
"Administration" □ "Users"

Functionalities:

- Mass Creation: Import from CSV/Excel files
- Role Assignment: Administrator, Director, Coordinator, Teacher, Parent
- Individual Management: Editing and deleting users
- Password Reset: For any system user

User Creation Process:

1. Click on "New User"
2. Complete form:
  - ID (automatic format validation)
  - Complete personal data
  - Institutional email
  - Phone number in Uruguayan format
  - Assigned role
3. Confirm with "Create User"



**Agregar Usuario**

Cédula \*

12345678

Nombre \*

Ingrese el nombre

Apellido \*

Ingrese el apellido

email \*

usuario@ejemplo.com

Teléfono

099123456

password \*

Contraseña

Roles \*

☐ ADMIN

☐ COORDINADOR

☐ DIRECTOR

☐ DOCENTE

☐ PADRE

Cancelar Guardar

## 3.2. System Monitoring

Access to Zabbix: <http://192.168.2.139:8080>

Metrics to Monitor:

- Performance: Response times, CPU/RAM usage
- Availability: Service and database uptime
- Security: Failed access attempts
- Capacity: Storage and memory usage

Critical Thresholds:

- Response time > 2 seconds
- CPU usage > 80% for more than 5 minutes
- Available memory < 20%

## 3.3. Logs and Audit System

Automatic Records:

- All logins (success/failure)
- Modifications to critical data
- Generation and publication of schedules
- Changes in system configuration

Audit Reports:

- Access by user and time
- Operations performed by role
- Unauthorized access attempts
- Changes in permissions and configurations

# 4. Role: Academic Direction

## 4.1. Teacher Management

Access: "Academic Staff" ☐

"Teachers" Exclusive Functions:

- Registration of New Teachers: Complete registration form
- Subject Assignment: Multiple selection from predefined list
- Data Modification: Update existing information
- Removal of Teachers: Only if they have no assigned schedules
-

### Teacher Registration Form:

- Personal data (name, ID, email, phone)
- Subjects taught (multiple selection)
- "Works in other high schools" indicator
- List of external institutions (if applicable)



**Gestión de Docentes**  
Administrar todos los docentes del sistema

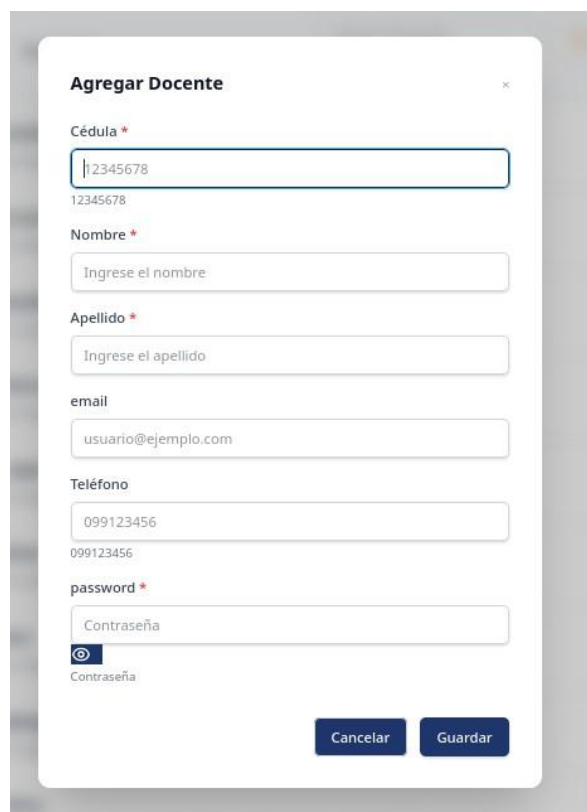
☐ Seleccionar Todo **Docentes**

Buscar docentes

Etiquetas ▼

Exportar

**+ Agregar Docente**



**Agregar Docente**

Cédula \*

12345678

Nombre \*

Ingrese el nombre

Apellido \*

Ingrese el apellido

email

usuario@ejemplo.com

Teléfono

099123456

password \*

Contraseña

Contraseña

Cancelar Guardar

## 4.2. Subject Management

Access: "Academic Configuration" □ "Subjects"

Creation Process:

1. Click on "New Subject"
2. Complete data:
  - Official name of the subject
  - ANEP Guideline Selection: Specific for distribution
  - Joint Teaching: Boolean checkbox
  - Shared Group: Selector if applicable
3. Save subject

Configurable ANEP

Rules:

- 1-2 hours per week □ Maximum 2 days
- 3-4 hours per week □ Maximum 3 days
- 5+ hours per week □ Maximum 4 days
- Physical Education □ Final hours of the shift
- Italian subjects □ End of schedule (mixed groups)

The image shows two screenshots from a web application. The top screenshot is titled 'Gestión de Materias' and shows the 'Pautas ANEP' tab. A red arrow labeled '1' points to the 'Pautas ANEP' tab, and another red arrow labeled '2' points to the '+ Agregar Pauta' button. Below the tab, there is a list of ANEP guidelines with checkboxes and 'Editar' and 'Eliminar' buttons. The bottom screenshot is a modal titled 'Agregar Pauta' with fields for 'Nombre de la Pauta', 'Días Mínimos', 'Días Máximos', and 'Condiciones Especiales', along with 'Cancelar' and 'Guardar' buttons.

**Gestión de Materias**  
Administrar todas las materias del sistema

Materias Pautas ANEP

Las pautas ANEP definen restricciones de horario para las materias. Cree las pautas necesarias aquí antes de crear materias que las utilicen.

☐ Seleccionar Todo Pautas ANEP

<input type="checkbox"/> <b>D</b> Distribución diaria estándar	Editar Eliminar
<input type="checkbox"/> <b>D</b> Distribución semanal extendida	Editar Eliminar
<input type="checkbox"/> <b>D</b> Distribución semanal múltiple	Editar Eliminar

**Agregar Pauta**

Nombre de la Pauta \*

Ingrese el nombre de la pauta

Días Mínimos \* Días Máximos \*

1 5

Condiciones Especiales

Ingrese condiciones especiales (opcional)

Cancelar Guardar



### 4.3. Schedule Publication

Access: "Schedules" ☐ "For Publication"

Publication Process:

1. Schedule Review: View schedules generated by coordination
2. Conflict Validation: System shows pending conflicts
3. Blocking by Conflicts: Cannot publish with critical conflicts (red)
4. Final Confirmation: Click on "Publish Official"

Schedules" Consequences of Publication:

- Schedules visible to teachers and parents
- Blocking of edits (requires unpublishing)
- Automatic notification to all users
- Generation of PDF certificates for teachers with +16 hours





## 5. Role: Academic Coordination

### 5.1. Automatic Schedule

Generation Access: "Schedules" ☐

"Automatic Generation" Mandatory

Pre-requisites:

-  Teachers with registered availability (minimum 20 hours)
-  Subjects configured with ANEP guidelines
-  Academic groups defined
-  Teacher-subject assignment

completed Generation Process:

1. Parameter Selection:
  - Academic period
  - Groups to include
  - Teachers to consider
2. Click on "Generate Schedules"
3. Process Waiting: Real-time progress bar
4. Results Review: Preview of the generated

schedule Processing Times:

- 10 groups + 20 teachers: < 5 minutes
- Progress bar with time estimation



- Notification upon completion

## 5.2. Schedule Manual Editor

Weekly Calendar Interface:

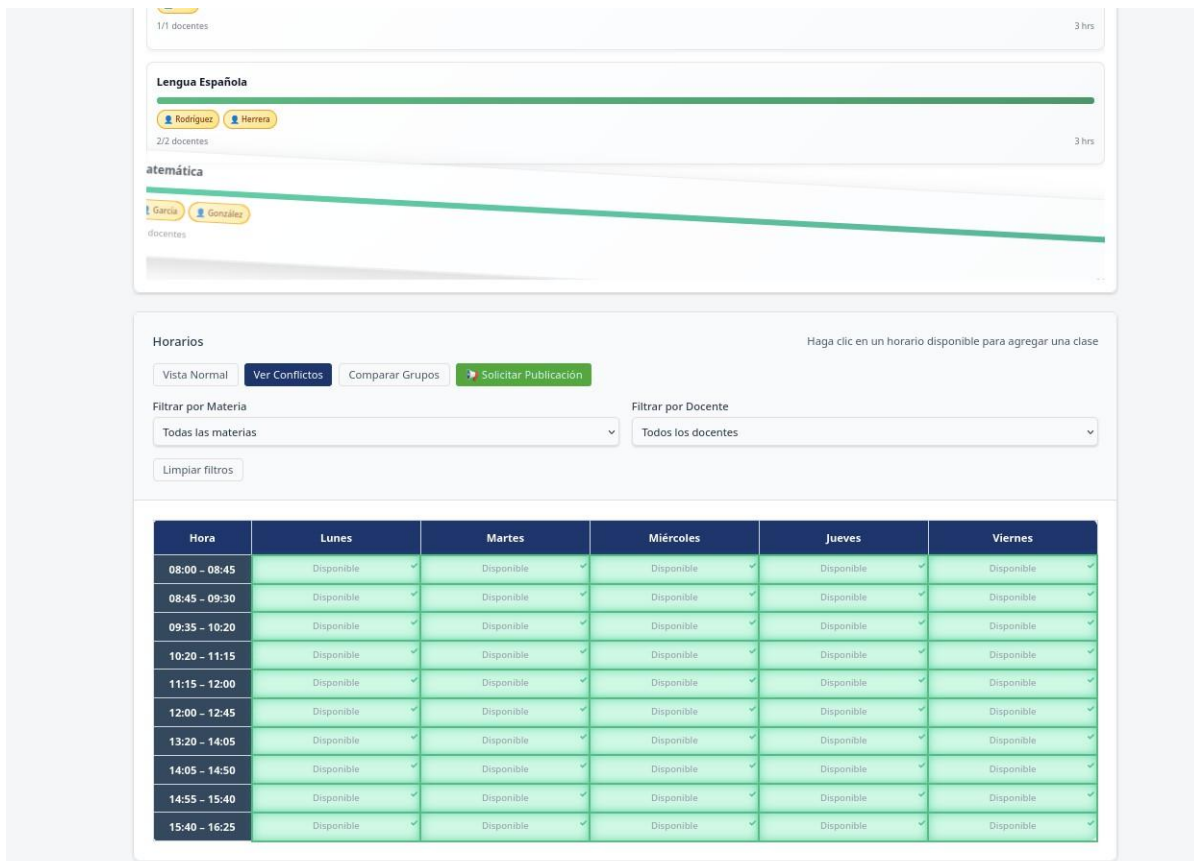
- Spreadsheet-like view (Monday-Friday columns, hours rows)
- Drag and Drop: Quick reassignments
- Click for Editing: Detailed cell modification
- Automatic Color Coding: Real-time conflict detection

Conflict System:

-  Red: Critical conflict (double-assigned teacher)
-  Yellow: Warning (time load limit, ANEP rule at the limit)
- Explanatory Tooltips: Details on hover
- 

Advanced Functions:

- Assignment Swap: Swap teachers between cells
- Replicate Patterns: Copy configurations between groups
- Real-Time Validation: Immediate feedback



The screenshot displays the 'Weekly Calendar Interface' for a school schedule. At the top, there are two subject assignment bars: 'Lengua Española' (1/1 docentes) and 'Matemática' (2/2 docentes). Below these, the 'Horarios' section provides filters for 'Filtrar por Materia' (set to 'Todas las materias') and 'Filtrar por Docente' (set to 'Todos los docentes'). A table below the filters shows the availability of teachers for each hour of the week (Monday to Friday).




Hora	Lunes	Martes	Miércoles	Jueves	Viernes
08:00 - 08:45	Disponibile ✓	Disponibile ✓	Disponibile ✓	Disponibile ✓	Disponibile ✓
08:45 - 09:30	Disponibile ✓	Disponibile ✓	Disponibile ✓	Disponibile ✓	Disponibile ✓
09:35 - 10:20	Disponibile ✓	Disponibile ✓	Disponibile ✓	Disponibile ✓	Disponibile ✓
10:20 - 11:15	Disponibile ✓	Disponibile ✓	Disponibile ✓	Disponibile ✓	Disponibile ✓
11:15 - 12:00	Disponibile ✓	Disponibile ✓	Disponibile ✓	Disponibile ✓	Disponibile ✓
12:00 - 12:45	Disponibile ✓	Disponibile ✓	Disponibile ✓	Disponibile ✓	Disponibile ✓
13:20 - 14:05	Disponibile ✓	Disponibile ✓	Disponibile ✓	Disponibile ✓	Disponibile ✓
14:05 - 14:50	Disponibile ✓	Disponibile ✓	Disponibile ✓	Disponibile ✓	Disponibile ✓
14:55 - 15:40	Disponibile ✓	Disponibile ✓	Disponibile ✓	Disponibile ✓	Disponibile ✓
15:40 - 16:25	Disponibile ✓	Disponibile ✓	Disponibile ✓	Disponibile ✓	Disponibile ✓

### 5.3. Teacher Availability Management

Complete Control Panel:

- Consolidated View: All teachers in one table
- Margin Percentage: Automatically calculated (available hours/hours assigned)
- Advanced Filters:
  - By number of observations (0, 1-2, 3-5, 6+)
  - By priority (works in another high school ☐ margin percentage)
  - By assigned workload

Status Indicators:

-  Less than 20 hours availability
-  20-30 hours availability
-  More than 30 hours availability

Editing Functions:

- Modification of availability for specific teachers
- Registration of observations on behalf of the teacher
- Visualization of change history

### 5.4. System of Predefined Observations

Access: "Configuration" ☐ "Predefined Observations"

Complete Management:

- Creation: New observations for the dropdown list
- Editing: Modification of existing text
- Deletion: Except for "Other" and "Other High School" (protected)
- Tabular Listing: Complete view of all observations

System Observations (Non-Deletable):

- "Other": Allows free text (500 characters maximum)
- "Other High School": Activates external institution fields

Creation Process:

1. Click on "New Observation"
2. Enter descriptive text
3. Assign optional category
4. Confirm creation

## 6. Validation and Conflict System

### 6.1. Automatic Validations

During Schedule Generation:

- Verification of minimum teacher availability (20 hours)
- Compliance with ANEP guidelines per subject
- Optimized distribution according to priorities
- Early detection of potential conflicts

During Manual Editing:

- Real-time validation of assignments
- Immediate alerts for schedule overlaps
- Verification of workload limits (40 hours maximum)
- Control of ANEP rules per subject

### 6.2. Conflict Management

Conflict Resolution Panel:

- Consolidated Listing: All conflicts detected
- Automatic Suggestions: Solutions proposed by the system
- Manual Approval: Confirmation of each resolution
- Final Report: Summary before sending to Management

Types of Conflicts:

- Critical (Red): Block publication (double teacher assignment)
- Warnings (Yellow): Do not block but require review
- Informative (Blue): Optimization recommendations

## 7. Established Work Processes

### 7.1. Academic Period Start Flow

Phase 1 - Preparation (Management):

1. Create new subjects if applicable
2. Register new teachers
3. Assign subjects to teachers
4. Configure academic groups

#### Phase 2 - Configuration (Coordination):

1. Verify teacher availability
2. Manage predefined observations
3. Configure generation parameters
4. Execute automatic

#### generation Phase 3 - Optimization

##### (Coordination):

1. Review generated schedules
2. Resolve detected conflicts
3. Make manual adjustments
4. Validate ANEP

#### compliance Phase 4 - Approval

##### (Management):

1. Review final schedules
2. Verify conflict resolution
3. Publish official schedules
4. Communicate to the educational community

## 7.2.Periodic Maintenance

#### Daily Tasks:

- Security log review
- System performance monitoring
- Attention to alerts and notifications

#### Weekly Tasks:

- Verification of automatic backups
- Cleanup of old logs
- Statistics update

#### Monthly Tasks:

- System usage report
- Performance metrics analysis

- Security policy review

## 8. Reporting and Documentation System

### 8.1. Automatic Reports

Schedule Reports:

- Consolidated by group, teacher, or subject
- Compliance analysis of ANEP guidelines
- Distribution of workload
- Detection of problematic patterns

Teacher Reports:

- Individual and comparative workload
- Consolidated margin percentages
- Availability vs. assignment analysis
- Teachers with multiple institutions

### 8.2. Generation of Certificates

Automatic for teachers with +16 hours:

- Proof of work in another institution
- Proof of justified activities

Automatic Process:

1. Detection during schedule generation
2. PDF generation with teacher data
3. Storage in system
4. Available for download from the Management panel



## 9. Advanced Problem Solving

### 9.1. Timetabling Problems

"Failed Generation"

- Verify that all teachers have a minimum of 20 hours availability
- Check that the subjects have ANEP guidelines assigned
- Confirm that there are no contradictory restrictions
- Verify available physical spaces

"Excessive Generation Times"

- Reduce number of groups/teachers in batch
- Verify server performance via Zabbix
- Contact the system administrator

### 9.2. Impossible Conflicts to Resolve

Common Causes:

- Very restrictive teacher availabilities
- Overlap of subjects together
- Physical limitations of spaces
- Conflicts with specific ANEP rules

Resolution Strategies:

- Adjust problematic availabilities
- Review assignment of subjects together
- Consider adjusting specific ANEP guidelines
- Consult with Management for exceptions

### 9.3. Performance Issues

Symptoms:

- Loading times greater than 2 seconds
- Operations that take longer than expected
- Timeout errors in generation

Corrective Actions:

- Verify metrics in Zabbix (
- Clear system cache
- Check database connection

192.168.2.139:8080)

- Contact the system administrator

## 10. Policies and Regulatory Compliance

### 10.1. ANEP Compliance

- The system automatically applies distribution guidelines
- Compliance reports available for inspection
- Documentation of justified exceptions
- Record of all assignments with justification

### 10.2. Data Protection

- Encryption of sensitive data (AES-256)
- Granular access controls by role
- Complete audit logs
- Configurable data retention policy

### 10.3. Operational Continuity

- 99% availability during school hours (8:00-17:00)
- Maximum recovery time: 30 seconds (BD connection)
- Automatic backup with 30-day retention
- Documented procedures for contingencies

Code	Description	Action
ERR-ADM-001	Insufficient permissions error	Administrator of roles Verify assignment
ERR-DIR-002	Attempt to publish with conflicts	Address Resolve critical conflicts critical
ERR-COO-003	Failed generation due to insufficient data	Coordinator Verify availabilities
ERR-SYS-004	Internal system error	Administrator Review logs and monitoring

## Appendix B - System Limits

- Concurrent users: 100 simultaneous
  - Maximum hourly size: 10 groups + 20 teachers
  - Schedule generation time: < 5 minutes
  - PDF export: < 30 seconds
  - Log storage: 30 days automatic rotation
-

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Controlled distribution documentation - Exclusive use for administrative roles